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THE GIFT OF
Professor William
H. Butts

The GENERAL MAGAZINE OF ARTS and SCIENCES,

PHILOSOPHICAL, PHILOLOGICAL, MATHEMATICAL, and MECHANICAL:

Under the following Heads, *viz.*

I. The young GENTLEMAN and LADY's PHILOSOPHY; or a particular and accurate SURVEY of the WORKS of NATURE, by way of DIALOGUE; illuſtrated by Experiments, and embelliſh'd with Poetical Deſcriptions; with an exact Account of all the Inſtruments uſed in the Philoſophical Sciences.

II. The NATURAL HISTORY of the WORLD; containing a juſt and particular Account of all that is remarkable in the Animal, Vegetable, and Mineral Productions of every Part of the Earth and Seas.

III. A compleat SYSTEM of all the PHILOLOGICAL SCIENCES, *viz.* Theology, Ethics, Mythology, Grammar, Rhetoric, Logic, Poetry, Geography, Chemiſtry, Botany, Anatomy, Phyſic, *&c.* according to the modern Theories and Improvements.

IV. A BODY of MATHEMATICAL INSTITUTES, or PRINCIPLES of SCIENCE; from whence the various Mathematical and Mechanical Arts and Sciences will be deduced, and applied to the manifold Purpoſes of Life.

V. MISCELLANEOUS CORRESPONDENCE, ESSAYS, POETRY, Remarkable Occurrences in the Month, Catalogue of Books, Prices of Stocks, *&c.*

By BENJAMIN MARTIN.

LONDON:
Printed for W. OWEN, at Homer's Head, in Fleet-ſtreet.
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Professor William H. Butts
10-14-1935

To His Royal Highneſs

THE

PRINCE of WALES.

SIR,

IN every Inſtitution of Government, founded on juſt Principles, the Felicity of the Prince and the People muſt neceſſarily be reciprocal, as it reſults equally from a wiſe and benevolent Exerciſe of Dominion in the one, and good Senſe, and rational Subjection, in the other: This is a Truth verified by a Reflection on the Fate of Nations in general, but more eſpecially confirmed by that of our own, as well in the laſt as preſent Reign, in which the Bleſſings of Nature have been accumulated on the *Britiſh* Nation almoſt to Profuſion, and we may ſay, with more Juſtice than could be ſaid of them in former Times, that the People would, if poſſible, be too happy were they truly ſenſible of their preſent bliſsful Situation in its utmoſt Extent. But to do

cur-ourſelves Juſtice, it muſt be allowed, we are not altogether inſenſible of our Happineſs; for I, with the higheſt Pleaſure, aſſure Your Royal Highneſs, that in more than half the great Towns in *England*, and among all Ranks of People, I have been a conſtant Eye and Ear-Witneſs of their univerſal Joy and Satisfaction with their preſent Condition; of their extraordinary Eſteem and Regard for the Perſon, Title and Government of his preſent Moſt Gracious Majeſty, and their moſt exalted Hopes, and higheſt Confidence in their future Sovereign: This good Diſpoſition, permit me, Great Sir, to ſay, is the natural Conſequence of encouraging the Studies of uſeful Arts and Sciences, Learning and Humanity; for theſe furniſh the Prince with Notions and Principles of Wiſdom, Religion, Virtue, and Liberty, and ſecure the People from the Attacks of Ignorance, Barbarity, Superſtition and Impoſture; and in every Perſon they produce a rational and noble Propenſity towards promoting the general Good of the Community, and the Promulgation of the Sciences among all Ranks and Orders of Men, and inculcate on their Minds Principles that will not fail to render them good Subjects: As this is the profeſſed Deſign of theſe Papers, I humbly preſume they will be acceptable to Your Royal Highneſs, and ſhall for ever eſteem it the higheſt Honour that I am permitted to offer them to Your Highneſs's Inſpection. That Heaven may preſerve his preſent Sacred Majeſty to the lateſt deſirable Period of Life, and then Your Highneſs aſcend the *Britiſh* Throne, and long reign the happieſt, as well as the greateſt, Monarch of the World, is the inceſſant Prayer of,

SIR,

Your Royal Highneſs's

Moſt dutiful, devoted,

And obedient humble Servant,

B. MARTIN.

An Account of the Plan and Deſign of this Magazine.

AS the higheſt Attainments of the human Mind conſiſt in uſeful Knowledge, the Perfection of our Nature can only reſult from thence; and, in order to promote that in the greateſt Degree, we muſt render the various Arts and Sciences as eaſy of Acceſs, or the Pathway to Knowledge as direct and plain, as poſſible: And this, in ſhort, is the Deſign of our preſent Publication. To effect which, we ſhall employ our Time and Abilities in the beſt manner we can, and therefore preſume that the Public, who are ever candid and ingenuous, will want no other Inducement to a good Opinion, and favourable Reception of ſuch an Undertaking.

But tho' the Merit of a Deſign may be indiſputable, yet the manner of executing it is a Thing very material, and therefore we ſhall here at large lay it before the Reader; ſince it too often happens, that the Expectation of the Public is mightily raiſed by Title-Pages, Propoſals, &c. but immediately ſubſides upon reading a few firſt Sheets of the Performance.

Our Purpoſe is to compile and preſent our Readers with *a real and general Magazine of Arts and Sciences*: Concerning which it is to be obſerved,

Firſt, That the Undertaking is in itſelf a Work entirely new; for though the Preſs has long groaned under the Weight of Magazines of various Complexions, not one of them has appeared with any Pretenſions of this Kind, moſt of them being calculated for Amuſement only; and as to the reſt, if the Words Arts and Sciences are found in their Title-Pages, you ſeek in vain for the Things themſelves, in the Body of the Work; or if any Thing of that Sort appears, it is only by Peace-meal, in Bits and Scraps, disjointed and mangled, without Order or Connection, and therefore of no Uſe to any one. On the contrary, in our Magazine, we propoſe a compleat Body of *real* Arts and Sciences for

I diſtinguiſh between thoſe that are *truly and really* ſo, and thoſe that are not: Since it is well known, that many Subjects have been uſhered into the World under the reſpectable Names of Arts and Sciences, to the great Abuſe and Deluſion of Mankind. Thus, formerly, the blaſphemous Jargon of *Aſtrology* was dignified with thoſe Epithets; and many other Subjects are deemed Sciences, but are falſely ſo called, as they convey no real Knowledge to the Mind.

Secondly, The Form of our Work is intirely new; for a Body of *Arts and Sciences* has never yet been attempted in any monthly periodical Publication, under the Title of a MAGAZINE. And this Form we rather chuſe, not only as it ſuits with the Humour and Taſte of the preſent Age, but alſo becauſe it will be the eaſieſt Way to communicate Subjects of this Sort, and attended with leſs Expence and Trouble as well to the Publiſher as the Reader; not only ſo, but a whole Body of Arts and Sciences poured out on the Public at once, might not perhaps be quite ſo pleaſing and acceptable, as when retailed out in monthly Portions; for now a Perſon cannot think one Half-ſheet upon a Science in a Month too much, as he will have Time enough to read and digeſt that before another comes to Hand, even in the more abſtruſe Arts, that require ſome Study and Attention: and ſince it will be in vain to crave for more than there can be Time to peruſe and underſtand, it is preſumed, that what has been now ſaid, may be a ſufficient Anſwer to an Objection that may poſſibly be made againſt a monthly Publication,—That it will be too ſlow, or tedious a Performance; but we ſhall make no Scruple to ſay, that admitting a Perſon has a good Genius, he will be allowed to make a great Proficiency, if he can make himſelf Maſter of the uſeful Arts and Sciences in the Compaſs of *Ten Years*.

Thirdly, There has been no compleat Syſtem, or Body of Arts and Sciences ſince the new Diſcoveries, and great Improvements in all the Branches thereof made in the laſt and preſent Age.

The Face of Philoſophy is entirely new, and a new Geometry has ſucceeded the old, which occaſions a general Renovation in all the Mathematical Sciences; the moſt ſubſtantial and ſolid Parts of Learning have therefore now a new Aſpect, and wear quite a different Dreſs from what they uſed to appear in. A general Syſtem of the Sciences, attended with ſo much Novelty and Utility, cannot

not now, we hope, but be very grateful to every Lover of Art and Friend to Learning.

Fourthly, The Novelty of our Method we may reaſonably ſuppoſe will be another Argument to recommend us; ſince our Plan is to carry on the four great Claſſes of Science at once. Variety never fails to pleaſe in other Caſes; and here it muſt have all its Force, ſince every Half-ſheet of our Magazine will be pregnant with new Principles of Knowlege, and every Number will preſent the Reader with a gradual Progreſs of the Sciences, proceeding Hand-in-Hand; when he has conſidered the Subject of one, he may apply himſelf to another, after that to a third and fourth, all different from each other, and each in particular ſuch, we preſume, as will be worthy his Attention, and afford him Pleaſure and Inſtruction at the ſame Time. After this, by Way of Relaxation and Amuſement, in the fifth and ſixth Half-ſheet, we ſhall preſent him with ſome of the choiceſt Pieces of Learning, Wit, Humour, Poetry, News, *&c.* all which we judge will be ſufficient to fill up the vacant Hours of each reſpective Month.

Fifthly, Another great Inducement to this Undertaking is, the ſatisfactory Proſpect we have of making the Arts and Sciences more generally known and uſeful to Mankind; for Experience forbids us to expect, that a general Publication of the whole at once, would ever fall into ſo great a Number of Hands as it probably may this Way, it is not conſiſtent with Prudence, in any Caſe, to overdo a Thing; People ſhould be gradually conducted from one Apartment to the other in the Temple of Science; for ſince one ſimultaneous View of the Whole would rather tend to confuſe than inſtruct the Mind, and deter from, rather than invite to a particular Examination of the Parts: Things, though ever ſo good in themſelves, by too great and ſudden a Profuſion, inſtead of exciting a Curioſity and Inclination, would probably create an Averſion, if not a *Nauſea* thereto. And therefore to avoid any Tendency to diſcourage the Study of the Sciences, we have thought it by much the beſt Way, to proceed in the Method of our preſent Plan.

We proceed now to give ſome Account of the Subject-Matter of the Work:

I. The firſt Part will conſiſt of a general Survey of the Works of Nature and Art, that is to ſay, we ſhall take a particular View of the ſeveral *Phænomena* of Nature, as they ariſe from the various Subjects that fall under our Obſervations, in the Heavens, the Air, the Earth, and Water, which we ſhall repreſent, illuſtrate and explain, by the ſeveral Inſtruments and Machines which Art has invented, or can ſupply for that Purpoſe, and that in the moſt eaſy and natural Manner, ſo that the Truth and Reality of the Nature and Cauſe of thoſe Appearances may be rendered quite obvious to the Underſtanding; for in this Part, we ſhall propoſe nothing but what we may reaſonably ſuppoſe all our Readers can underſtand; and in order to do this more effectually, we ſhall propoſe it in the common Way of Experiments, ſince it is found by general Experience the beſt of all accommodated to convince the Underſtanding, as it conſiſts in little more than an Appeal to the common Senſe of Mankind. We oftentimes expreſs great Diffidence with reſpect to our intellectual Faculties, but few People are ſo fooliſhly modeſt as to diſtruſt their Senſes in Caſes where Objects are propoſed to them in a proper Manner; and ſince the Senſes are the general Inlets and Means of Knowledge, and are formed as accurately and juſt as perfect, in one Sex as the other, therefore theſe philoſophical Subjects muſt be, in this Way, equally intelligible to both; conſequently the LADIES may be admitted to the Pleaſure and Advantage of theſe Speculations as well as Gentlemen, if not with more Reaſon, ſince Gentlemen have generally an Opportunity of coming to the Knowledge of theſe Things, in a way different from that of the Fair Sex: And therefore we have propoſed it in Dialogues between a young Gentleman and a Lady in the natural and eaſy Way of Converſation; by which Means we hope the Inſtruction will be more eaſily conveyed, and attended with much greater Pleaſure than in the common, dry and tedious Dialogues, heretofore written on theſe Subjects. Moreover, the Inſtruments and Machines themſelves will be very particularly deſcribed, and many new ones introduced, with their Advantages and Excellencies pointed out; alſo Copper-Plates and Diagrams will be ſupplied where ever they are wanted for Illuſtration. *Laſtly*, to render the Whole as compleat as poſſible, we ſhall frequently embelliſh the Subject with the moſt beautiful Deſcriptions, Alluſions, and Similies that can be found in the moſt celebrated antient and modern Poets; ſo that upon the

Whole, we hope we may be allowed, with great Propriety, to give this Part the Title of the YOUNG GENTLEMAN AND LADY'S PHILOSOPHY.

II. The ſecond Part of our Work will conſiſt of an entire Syſtem of the natural Hiſtory of the World, or ſo much of the Knowledge of the natural Productions of the Earth and Sea as we have hitherto been able to diſcover; and here our Subject will naturally divide into ſeveral general Heads, *viz.* *Firſt*, the Situation, Extent, Soil, Produce, Climate, Air, Length of Days and Nights, *&c.* of each reſpective Country, the Diſpoſition and Genius of the Inhabitants, their Cuſtoms, Manners, Language, *&c.* *Secondly*, every thing remarkable in, and peculiar to each Country, with reſpect to their Beaſts, Birds, Reptiles, Inſects, and Fiſhes in the Seas contiguous. *Thirdly*, their Mountains, Springs, Rivers, and mineral Waters. *Fourthly*, every thing conſiderable in regard to vegetable Productions, relating to Trees, Shrubs and Plants. *Fifthly*, Mines, Ores, Minerals, Foſſils, Marcaſites, Stones, Earths, Marls, *&c.* in ſhort, every thing that Hiſtory and our own Obſervations can furniſh, deſerving the Reader's Notice, relating to the Animal, Mineral, and Vegetable Kingdoms. Upon theſe Subjects we ſhall conſult only ſuch Authors whoſe Veracity and Credit is unqueſtionable, and where ever the Narrative is wonderful, we are ſatisfied it is true; and this we ſhall be particularly careful about, as it is but too well known how much the World has been impoſed upon by fabulous and falſe Accounts of Things in the Writings of antient and modern Naturaliſts; things enough will be found, not only to amuſe our Readers, but to excite their Admiration and Surprize, without having recourſe to the low Arts of Impoſture, Frauds and Falſity. Upon the Whole, we ſhall endeavour to preſent the Reader with ſuch a Body of natural Hiſtory, both of our own and other Countries, as ſhall have nothing but the Marks of Simplicity and Truth to recommend it.

III. The third great Part of our Plan is intended to conſiſt of a compleat Body of Arts and Sciences which are not Mathematical, ſuch as *Natural Theology*; *Ethics*, or *Morality*; *Revealed Religion*; *Paganiſm*, *Mythology*, *Grammar*, *Rhetoric*, *Logic*, *Metaphyſics*; *Poetry*, *Geography*, *Chronology*, *Hiſtory*, *Phyſiology*, *Botany*, *Chemiſtry*, *Pharmacy*, *Phyſic*; *Anatomy*, *Mineralogy*, *Metalurgy*, and many other Branches of manual and commercial Arts, Trades, and Manufactures.

Theſe different Kinds of Knowledge we ſhall treat of in the moſt natural, methodical and conciſe Manner, according to the moſt approved Authors, and the beſt Theories that our preſent State of Learning will furniſh, and ſhall venture in many Places to make no ſmall Innovations, by adding many things new, and retrenching all the ſuperfluous Parts of the old Syſtems; and by this Means ſhall endeavour to exhibit every Science in its proper and native Light: They will here no longer appear in their dry ſcholaſtic Forms, but in all the beautiful Simplicity that the genuine Principles of real Science can give them. We need not here expatiate on the Utility of theſe Branches of Knowledge, ſince it is well known, that in all Ages, and in every Nation, they have made the principal Part of Learning, diſtinguiſhed by the Title of the *Belles Lettres*, though far ſhort of that Perfection to which they have attained in the preſent Age, and in our own Nation in particular, theſe Sciences ſtill farther recommend themſelves by the Plainneſs of their Principles, and being ſo eaſily underſtood; particular Talents for other Sciences are required, but theſe are equally adapted to every ingenious Mind, and ought to be the Study of the *Gentleman* as well as the *Scholar*, ſince they make the great and ſubſtantial Part of what we properly underſtand by a polite and genteel Education. In the laſt Place, it muſt be obſerved, that theſe Sciences are not only uſeful to Mankind in general, but many of them ſuch as are abſolutely neceſſary; for what is Man without the Knowledge of Religion? Without the inſtructed Faculty of Reaſoning? Without the Art of ſpeaking properly and writing gracefully? Without the Knowledge of paſt Times and Events? Or without Skill in the fundamental Arts and Profeſſions? From all which we may juſtly infer, that theſe are true and real Sciences, and greatly dignify human Nature.

IV. The fourth great Part will conſiſt of a continued Series of mathematical and mechanical Inſtitutes or Principles of geometrical Science, beginning with thoſe that are the moſt ſimple and eaſy, and proceeding to the more compounded and ſublime: our Readers therefore will excuſe our preſenting them in the firſt Place with the Rules of common Arithmetic, Vulgar and Decimal, as they are the firſt Principles of all mathematical

Science; we then ſhall lay down a Compendium of Logarithms, whoſe Uſes are well known to every ingenious Philomath; after theſe follows the Analytic Art, or the Principles and Rules of *Algebra*, then the Theorems and Problems of *common Geometry* in a new and conciſe Method; we ſhall then deliver the Properties of the *Conic Sections*, *viz.* the *Ellipſis*, *Parabola* and *Hyperbola*. To this will ſucceed the Doctrine of the Sphere, or the Principles of ſpherical *Geometry*. After this, we propoſe an extenſive View of the new Matheſis, which may properly be called the Newtonian *Geometry*, as it principally conſiſts in the *Doctrine* of FLUCTIONS, which was entirely the Invention of Sir *Iſaac Newton*, and from which the mathematical Sciences received their higheſt Perfection and their final Improvement. From the Inſtitutions of *common Geometry*, conſidered as the Theory, we ſhall deduce a regular *Praxis*, or Syſtem of mathematical Sciences, ſuch as *Menſuration* of *Superficies* and *Solids*; of Heights, Depths and Diſtances; *Gauging*, *Surveying*; *Navigation*, in ſeveral Kinds, plain and *ſpherical Trigonometry*; the Rules of *Perſpective*; Projection of the *Sphere*; the Art of *Dialing*; *Aſtronomy*; the Principles of *Mechanics*, &c. with a practical Application in all the uſeful Parts of Buſineſs. And from the Inſtitutions of the *New* or *Fluxionary Geometry* we ſhall give the Solution and Application of all the grand Problems relating to the Quadrature of curvilined Spaces, the Cubature of Solids, the Rectification of Curve Lines; the Method de *Maximis* and *Minimis*, of drawing Tangents to Curves; of finding the Radius of Evolution; of finding the Points of Inflection and Retrogreſſion in Curves; of finding the Centers of Gravity and Percuſſion; the Laws of Elaſtic and Non-elaſtic Bodies; of the Velocity, Times and Spaces deſcribed by Bodies in Motion; the Laws of Reſiſtance in Fluids; the Doctrine of circular Motions and central Forces; the Doctrine of Projectiles in *Vacuo*, and in reſiſting Mediums; the Theory of Catoptrics and Dioptrics; the phyſical Part of Aſtronomy, and various other Subjects, which only this Sort of Geometry can reach, all which will be treated of in as plain and eaſy a Manner as the Nature of them will admit, and in a Method in many reſpects quite new.

V. The Thing we have next in View is to entertain our Readers with every thing curious and worth their Notice, communicated by any ingenious Correſpondent, whoſe Lucubrations or

Eſſays in any Branch of Science, Wit, Humour, or Buſineſs, will be acceptable, and thankfully received for that Purpoſe; many things in a miſcellaneous Way may by this Means be conveyed with great Advantage to the Public; the Divine, the Mathematician, the Philoſopher, the Gentleman, the Ladies of *Helicon* and *Parnaſſus*, the Critic, the Hiſtorian, the Antiquarian, the Merchant, the Mechanic, and the Manufacturer, may here find an Opportunity every Month of communicating their Thoughts for the Entertainment and Inſtruction of Mankind; and every ſuch Contributor ſhall have the Credit and Honour of his Invention and Performance ſecured to him by affixing his Name thereto if he chuſes it, and though we ſhall take Occaſion now and then to tranſcribe ſuch Things as we think proper for our Purpoſe from Pieces already in print, we ſhall at the ſame Time take particular Care to let the World know to whom they are indebted for it.

VI. In the laſt Place, our Magazine will conclude with an hiſtorical and chronological Memoir of all public Events of the paſt Month worthy Notice; the State of our own and other Nations will here appear; the Births, Marriages, Promotions, Deaths, *&c.* of all illuſtrious Perſons, will be commemorated, as well as the great Actions and Virtues that raiſed them to public Notice, and diſtinguiſh them from the reſt of Mankind. A regular Account of Books publiſhed Abroad and at Home, with a ſhort Account of the Contents of ſuch as deſerve it. The Prices of Stocks and Goods at the *Keys* in *London* and Country-markets, with every other important Article of public Intelligence.

To conclude, no Expence of Copper-plates, Diagrams, or Cuts will be ſpared for illuſtrating the ſeveral Parts of this Work, nor will the Public be troubled with any that are trivial or uſeleſs. The Materials for this Work have been long compiled and often reviſed and altered—we hope for the beſt. In many Parts of the Work, the Reader will meet with the Generality of Inſtruments either quite new, or differently conſtructed from thoſe hitherto publiſhed. The Subject-matter in many Places is alſo quite new, as well as the Method of repreſenting it. The Pages of each Half-ſheet will be properly numbered for binding up each reſpective Subject. In ſhort, the Whole will be a compendious View of the Learning of the preſent Age in all its numerous Branches, which we ſhall conſtantly endeavour to execute to the beſt of our Abilities. To conclude, That nothing may be wanting to make every thing agreeable as well as uſeful, a new and elegant Letter has been caſt for this Work, good Paper provided, and the beſt Engravers engaged. We hope every future Number will convince the Public, we aim at the greateſt Perfection that can poſſibly be attain'd to in ſuch a Work, and we deſire their Acceptance of our Labours only in Proportion to the Merits of the Performance, which will ſufficiently recompence their

Moſt Obedient,

Humble Servant,

B. MARTIN.

BIOGRAPHIA PHILOSOPHICA;

Or, a ſuccinct ACCOUNT of

The LIVES of the moſt eminent PHILOSOPHERS and MATHEMATICIANS, from the higheſt Antiquity to the preſent Time.

IN WHICH

The Places of their Birth; their peculiar Genius, and Manner of Study; their Travels for Improvement; the particular Branches of mathematical or philoſophical Science in which they excelled; the Inventions, and Diſcoveries they made, and the Books they publiſhed on the various Subjects of Natural Hiſtory, Philoſophy, and the Mathematics, will be methodically related, and digeſted according to the Order of Time in which they lived.

The LIFE of THALES *the* MILESIAN.

THALES was born, as the beſt Writers agree, in ſome Part of the 35th Olympiad, flouriſhed in the 50th, and died about the 58th; the Interval between his Birth and public Appearance in *Greece*, was paſſed in Study, and Travels in various Parts of *Aſia*, and into *Ægypt*; in the former he acquired his firſt Inſight into *Aſtronomy*, and, in the latter, his firſt Acquaintance with *Geometry*, *Myſtical Divinity*, and *Natural Knowledge*. Having finiſhed his Studies abroad, he returned to his Native City, *Miletus*, and tranſported the Stock of Learning he had acquired into his own Country.

There are not any particular Circumſtances mentioned in his Hiſtory reſpecting ſignificant Occurrencies in his Travels, other than the Favour he met with from *Amaſis* King of *Ægypt*, which Favour he loſt by being too free in his Opinions concerning Kings; was, by ſuch Freedom, obliged to leave the Country; which was the probable Cauſe of his returning, at that Time, to *Miletus*.

In *Miletus* he lived for ſome Time as private as poſſible, devoted to Study and Contemplation, and in inſtructing ſome few in the Learning he had acquired. Theſe were *Anaximander* and *Anaximines*, both Natives of *Miletus*; and afterwards *Pythagoras*, of what Country unknown, but uſually called of *Samos*, ſo famed, as the Conſtitutor of the *Italic Sect*, and who aſſiduouſly purſued his Maſter's Steps, both in his Studies, and in his Travels.

Thales, in this his Retirement, was courted by many, but cautiouſly avoided either attending, or receiving any Favours from them. He was often viſited by *Solon*, and is ſaid to have taken great Pleaſure in the Converſation of *Thraſybulus*, whoſe excellent Wit cauſed our Philoſopher to forget that he was Tyrant of *Miletus*.

There flouriſhed, at the ſame Time with him, ſix others, diſtinguiſhed for their ſingular Wiſdom by their Morals, Rules, and Practice; but the Epithet of *Wiſe* was given to *Thales* for his ſpeculative Learning.

Laertius, and with him various other Writers, agree, that he was the Father of the *Greek* Philoſophy, the firſt that made any Reſearches into natural Knowledge, or Enquiry into Mathematics.

His Doctrine was, that Water, Moiſture, or Humidity is the firſt Principle of natural Bodies, whereof they conſiſt, and whereinto they reſolve; and that *God* is the Mind, which formed all Things of Water.

Of the World, he taught, there was but one, and that made by God; that it is diſpoſed in due and regular Order, and that God animates the whole.

In *Geometry* he is ſaid to have been an Inventor, as well as an Improver; a Science that had its Birth by Neceſſity in *Ægypt*, where *Thales* acquired his primary Inſtruction, as Commerce firſt gave Being, by the like Neceſſity, to *Numbers*.

He gave the firſt Light into the Knowledge of ſcalenous, and other Triangles, many of which *Euclid** has digeſted into his *Elements*; but that for which he is more particularly celebrated, as being, according to *Laertius*, his Invention, is what now appears as the 47th Propoſition of *Euclid*, *That the Sums of the Squares of the two leſſer Sides of a right angled Triangle is equal to the Square of the greater Side*; which is, however, diſputed as the Invention of his Diſciple *Pythagoras*. But all the Writers agree, that he was the firſt, even in *Ægypt*, who took the Height of the Pyramids by the Shadow, in the Manner the ſame is now uſually effected, and therefore needs not any Illuſtration.

As an *Aſtronomer*, he divided the celeſtial Spheres into five Circles, or Zones, the *Artic*, the *Summer Tropic*, the *Equator*, the *Winter Tropic*, and the *Antartic Circle*, placing the *Zodiac* under the three middle Circles, touching them all as it paſſes, and each of them cut in right Angles by the Meridian, that extendeth from Pole to Pole: Which have unjuſtly been aſcribed to more modern Diſcoveries.

He firſt obſerved the apparent Diameter of the Sun, which he concluded to be the 720th Part of the Circle or Zodiac, which he appears annually to deſcribe about the Earth, which is divided into 360 Degrees; and firſt diſcovered the Conſtellation of the leſſer Bear.

He likewiſe firſt obſerved the Nature and Courſe of *Eclipſes*, and calculated them to an Exactneſs; one in particular, about the 50th Olympiad, memorably recorded by *Herodotus*, as it happened on a Day of Battle between the *Medes*, and *Lydians*, which, *Laertes* ſays, he had foretold to the *Ionians*. And the ſame Author informs us he divided the Year into 365 Days; but this Diviſion he ſeems to have had from the *Ægyptians*. *Plutarch de placit. Philos*, not only confirms his general Knowledge of Eclipſes, but that his Doctrine was, that an Eclipſe of the Sun is occaſioned by the Intervention of the Moon, as may be ſeen in a Baſon of Water, or Looking-glaſs; and that an Eclipſe of the Moon is cauſed by the Intervention of the Earth.

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* Lib. 1. Def. 17.—Prop. 5.—Prop. 15. Id. 26.

The Writers of his Life agree, that he was addicted to judicial Aſtrology; and *Tully* thinks there is ſomething in that Science, and of his Acquaintance there-with; which he aims to confirm by the following Story:

That *Thales* being upbraided for his Poverty, reſulting from the Study of Science, and foreſeeing by his Skill in Aſtrology, there would be a Plenty of Olives that Year, he purchaſed all the Gardens about *Miletus* and *Chios*, and thus having acquired a Monopoly, diſpoſed of them again at high Prices, and then told his Neighbours, that it was very eaſy for Men of Learning to be rich if they choſe it, but that Wealth was not their Aim.

Laertius, and ſome others, agree with *Tully* in the Notion of this being an Aſtrological Prediction, which is far from being a clear Point: It is ſufficient, that he was capable of making a good Judgment of the approaching Seaſon, and that it would be ſuch a Seaſon, as wherein Olives are uſually moſt plentiful. This, however, ſufficiently evinces, that he had more worldly Wit than his Neighbours conceived, when he thought proper to employ it; as is the Caſe of moſt ſtudious Men, when they turn their Attention that Way, and affect the Object, as by Study they acquire a Sagacity and Penetration not common to the In-attentive: But, as Self-intereſt is the ruling Paſſion of our Natures, Men turned only to the Attainment of Wealth, will, with ſome Reaſon, ſmile at thoſe who reduce themſelves to Poverty, in order to make others learned.

It is a ſufficient Illuſtration of the Wiſdom of *Thales*, that he was the Inventor, or Improver, in many Branches of uſeful Knowledge; and whether right or wrong in his Contempt of Wealth, his Sagacity in other Reſpects ſuperior to moſt Men.

His *Morals* were as juſt, as his *Mathematics* well grounded, and his Judgement in civil Affairs equal to either; ſo that his Knowledge was as general, as the Good of Mankind his Care; and as we have given a brief Account of his Skill in Science, it may not be amiſs to give here a conciſe Taſte of his Morals, ſummed up in a few Lines.

Fear e'er thou ſin, thyſelf, tho' none be nigh,
Life fades, a glorious Death can never die;

Let not thy Tongue diſcover thy Intent,
'Tis Miſery to dread, and not prevent.
He helps his Foes that juſtly reprehends;
He that unjuſtly praiſeth, harms his Friends;
That's not enough, that to Exceſs extends.

He was very averſe to Tyranny, and eſteemed Monarchy little better in any Shape; he was uſed to ſay, That a Tyrant, who chuſeth rather to command Slaves than Freemen, is like an Huſbandman who preferreth the gathering of Locuſts and catching of Fowls, to the reaping of Corn.

Concerning his Writings, it remains doubtful whether he left any behind him. *Auguſtine* mentions ſome Books of *Natural Philoſophy*; *Simplicius*, ſome written on *Nautic Aſtrology*; *Laertius*, two Treatiſes on the *Tropics* and *Equinoxes*; and *Suidas*, a Treatiſe on *Meteors*, written in Verſe.

His Death happened in Point of Time as is ſaid above; the Occaſion appears to have been his attending the *Olympic* Games, where, oppreſt with Heat, Thirſt, and the Weakneſs of his Years, he, in public View, ſunk into the Arms of his Friends.

He was buried, according to his own Appointment, in an obſcure Part of the *Mileſian* Fields, where he predicted in future Times their *Forum* ſhould be.

NOTES.

Page 1. *Line* 2. An *Olympiad* was a Meaſure of Time uſed by the antient *Grecians*, conſiſting of 4 Years; it was firſt inſtituted by *Iphitus*, in the Year of the World 3174, on Account of the *Olympic Games*, which were celebrated every 5th Year in the Planes of *Elis*, near the City of *Olympia*, in Honour of *Jupiter Olympius*.

Page 2, *Line* 22. The Seven *Wiſe Men*, were *Thales*, *Solon*, *Pittacus*, *Periander*, *Cleobulus*, *Chilo*, and *Bias*, greatly renowned through all Antiquity.

Page 2, *Line* 30. That this Doctrine (tho' very antient) is not wide of the Truth, appears by many modern Experiments on the Nature of Vegetation of Plants and the Animal Oeconomy, the Generation of Metals and Foſſils, &c. as we ſhall ſhew in its proper Place.

ANAXIMANDER.

ANAXIMANDER, a *Mileſian*, Countryman, Companion, Kinſman, Diſciple, Succeſſor, and Propagator of the Doctrine of *Thales*, was born in the 42d *Olympiad*. He demonſtrated the Compendium of Geometry, and firſt publiſhed a Geographic Table. As early as the 50th *Olympiad* he publickly explained the Obliquity of the *Zodiac*, and invented the *Gnomon*. He was Maſter of every Branch of *Aſtronomy*, imputed to *Thales*; and if *Tully* and *Pliny* may be depended upon, he was deeply ſkilled in *Natural Philoſophy*, predicting the famous Earthquake that overturned the City of *Sparta*, and tore away Part of the Mountain *Taygetus*; he wrote, as *Suidas* informs us, a Treatiſe *De Naturâ*: as alſo one on the *Sphere*, and divers others.

He is ſaid to have differed from *Thales*, holding *Infinity* to be the Principle of all Things; but this, perhaps, is not different, as it is not explained what is meant by *Infinity*, unleſs this myſtical Expreſſion elucidates his Intention: That, *it is one infinite in Magnitude, the Parts thereof changing, the Whole immutable, out of which all Things proceed, and into which all Things reſolve.* Hence, that there are infinite Worlds generated, which corrupt and degenerate into that from whence they proceeded.

The various Writers of his Life, conſidering him as an Aſtronomer, ſeem in many Inſtances either to have miſunderſtood him, or given us their own Abſurdities, for his Opinions; they are therefore, replete with Contradictions, I ſhall for that Reaſon only recite ſuch as are conſiſtent with themſelves. He held the Doctrine of *innumerable Worlds*; That *the Orb of the Sun is 28 times bigger than the Earth*; *and that the Moon hath a thin Light of her own, beſides that which ſhe borroweth from the Sun.*

His Opinions concerning *Meteors* are the ſame as thoſe eſpouſed by the beſt Philoſophers of later Ages; and his Notion of the Origin of *Beings* was, that the firſt Creatures were generated in Humidity, which is the ſame as *Thales* taught, of Water being the Principle of all Things; whence it may be concluded, that *Anaximander* diſtinguiſhed between Principle and Element.

The Time of his Death is no where aſcertained, ſo as to agree with his Birth, Age, and his being the Succeſſor of *Thales*:

For which Reaſon I ſhall leave that Particular unnoticed, as a long Criticiſm on that Head is not material to the preſent Purpoſe.

ANAXIMENES.

ANAXIMENES was firſt the Diſciple of *Thales*, and afterwards an Auditor of *Anaximander*; he was of the ſame Country with both, and the Succeſſor of the latter. He held *Air* to be the Principle of the Univerſe, of which all Things are engendered, and into which all reſolve. That *Spirit* and *Air* are only two Words ſignifying the ſame Thing. His general Opinion of the *Heavens* and *Meteors*, was the ſame as his Maſters; and of the Cauſe of the *Rainbow*, the ſame as in modern Philoſophy: That *Earthquakes* proceed from the Rarity and Dryneſs of the Earth, from Exceſs of Heat, or Cold; the latter he called *Contraction*, or *Condenſation*, the former *Laxation* or *Rarity*: Thus illuſtrated, a Man's Breath compreſſed by his Lips and condenſed, is cold, (as when we blow on any Thing to cool it,) but iſſuing from an open Mouth, is hot, by reaſon of its Rarity. And more than this we do not find concerning him.

ANAXAGORAS.

ANAXAGORAS was a Native of *Glazomena*, and born in the 67th *Olympiad*. He was eminent for his noble Birth and wealthy Poſſeſſions, but more for his Contempt of them, which he quitted for the Delights of Philoſophy, turning his Thoughts from Civil Affairs to the Acquiſition of Natural Knowledge; but for his Improvidence herein *Plato* highly blames him, becauſe a Competency might rather aſſiſt, than be an Impediment to him in the Attainment of human Wiſdom. Being aſked, Why he had no Regard to his Country? he, pointing to the Heavens, anſwered, *My greateſt Regard is to my Country*. And again, To what End he was born? he anſwered, *To contemplate the Sun, Moon, and Heavens.*

In the 20th Year of his Age he went to *Athens* to ſtudy Philoſophy, and continued there 30 Years. He is reputed the firſt who added *Mind* to *Matter*, and on that Account he was honoured by the *Athenians*. Some of his Cotemporaries, however, diſputed his Right to this Honour; alledging, That this Sentiment was taught much earlier, as no Doubt it was, tho' not in that Country.

His Opinion of a ſupreme Being was much clearer, more rational, and intelligent, than any of his Predeceſſors in *Greece*; he held that GOD is an infinite ſelf-moving Mind, and the efficient Cauſe of all Things; that the ſame divine Mind, out of infinite Matter conſiſting of ſimilar Parts, made every Thing according to its Species, reducing into Order what was before confuſedly mingled together. His Conceptions of Nature were, That the upper Regions were replete with Fire, and the operative Power there he called *Æther*. His Notion of the *Sun*, that it was a burning Plate, the common Opinion of that Time; but that the *Moon* was a dark Body enlightened by the *Sun*, habitable, having Hills, Plains, and Waters; that the Inequality in her Face proceeded from a Mixture cold and Earthy, and that the *Milky Way* is the Light of ſome Stars.

The *Winds* he conceived to proceed from an Extenuation of the Air by the Sun: And that *Earthquakes* are cauſed by the Air, apt to aſcend, but finding Difficulty in getting out, cauſeth that Perturbation, effected principally by the exterior, at certain Times breaking in upon the interior Air, and there producing the ſame Force as we perceive, when, upon the Colliſion of the Clouds, and Motion of the agitated Air, they produce Thunder and Lightning.

His Thoughts concerning the Animal World, That Creatures were firſt generated by Humidity, Calidity, and earthy Matter.

That the Voice is produced by the ſtriking of the Wind againſt firm reſiſting Air, returning the Counter-blow to the Ear; which is the Manner whereby alſo the Repercuſſion of the Air is formed called *Echo*; and that the *Gall* is the Cauſe of *acute Diſeaſes*, which, over-flowing, is diſperſed into the *Lungs*, *Veins*, &c.

Laertius

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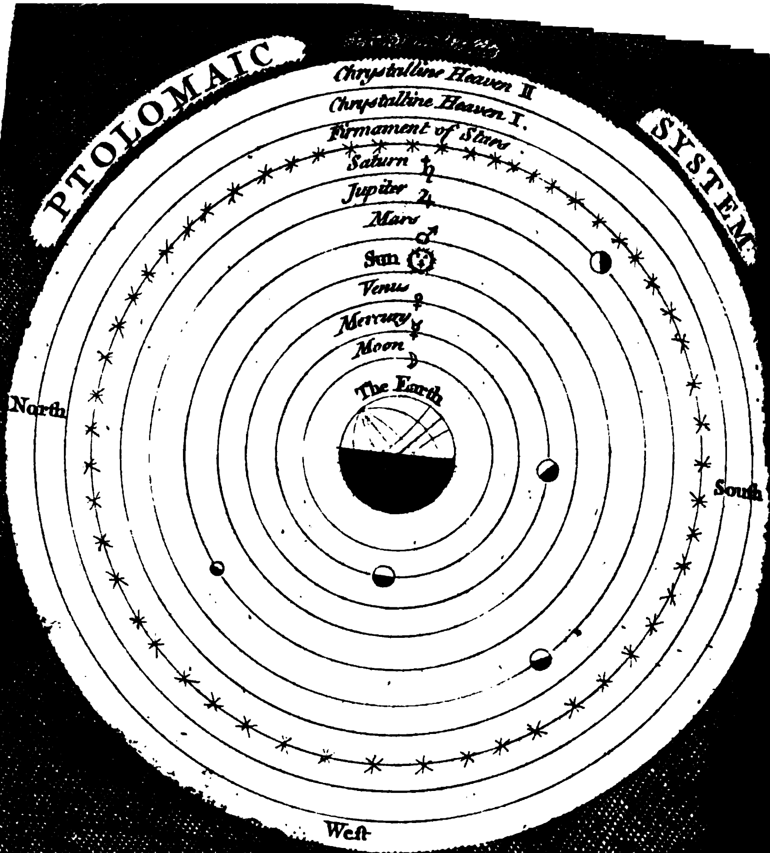
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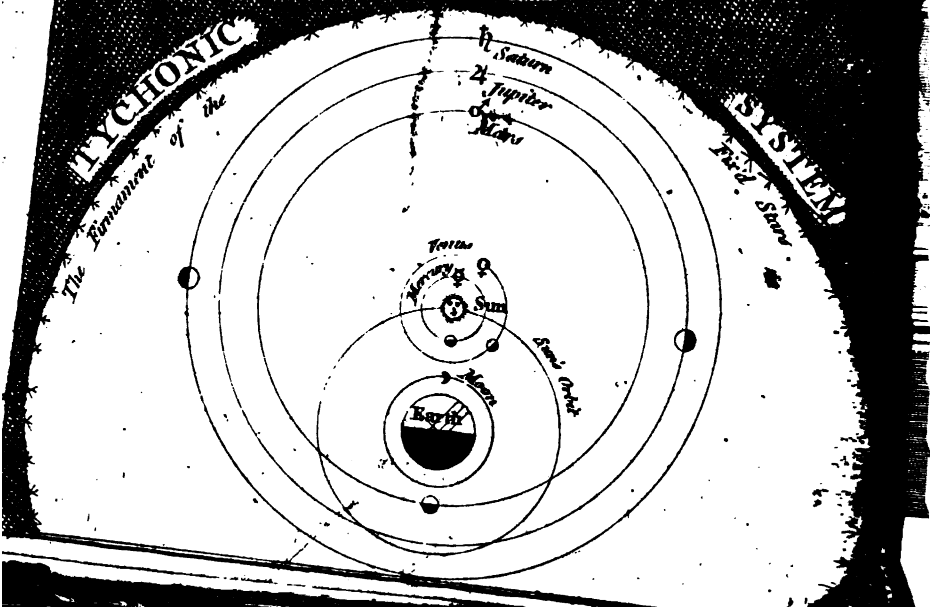
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The Young GENTLEMAN and LADY's PHILOSOPHY.

DIALOGUE I.

The Introduction.

Euphroſyne.

DEAR *Cleonicus*, I've been ſo affected with the pleaſing Diſcourſe you entertained us with laſt Night, that I know not which is greateſt, my Joy in ſeeing ſo near a Relation after ſo long Abſence at College, or the Happineſs I conceive will redound to me, and the Family, from the great Abilities and Improvements you've there acquired.

Cleonicus. Dear *Euphroſyne*, as I have been very induſtrious in improving my Time and Talents at College; ſo if any Satiſfaction or Happineſs reſult from thence to any Perſon, and eſpecially to yourſelf, dear Siſter, I ſhall think myſelf highly compenſated. Your remarkable Diſpoſition to reading, I ſee, with the greateſt Pleaſure, has given you an elegant Taſte, and rendered you capable of underſtanding, and converſing with Perſons on ſuch Subjects as come but too rarely on the Carpet in any Converſation, eſpecially that of your Sex.

Euphroſ. I ſuppoſe, Brother, you intend to make me a Compliment: Indeed I love reading very much, but wiſh I were more capable of improving by it. Philoſophy, I mean the Knowledge of natural Things in general, is what I ſhould be greatly pleaſed in the Study of, were it not ſo difficult a Science. I was charmed with the beautiful Sketches you gave the Company Yeſterday of ſome Parts of it.

Cleon. Philoſophy is the darling Science of every Man of Senſe, and is a peculiar Grace in the Fair Sex; and depend on it, Siſter, it is now growing into a Faſhion for the Ladies to ſtudy Philoſophy;

and I am very glad to ſee a Siſter of mine ſo well inclined to promote a Thing ſo laudable and honourable to her Sex.

Euphroſ. I often wiſh it did not look quite ſo maſculine for a Woman to talk of Philoſophy in Company; I have often ſat ſilent, and wanted Reſolution to aſk a Queſtion for fear of being thought aſſuming or impertinent. I ſhould be glad to ſee your Aſſertion verified: How happy will be the Age when the Ladies may modeſtly pretend to Knowledge, and appear learned without Singularity and Affectation! But can you give any Inſtances within your Knowledge of any Perſons of our Sex remarkable for this new Caſt of Thought?

Cleon. Yes, dear Siſter, ſeveral; in *London*, *Oxford*, and many other Places. I ſhall mention in Particular, *Euprepia*, a younger Daughter of *Eugenius*, to whom Nature has not been more indulgent in *Genius*, and fine Parts, than her Father has been careful in beſtowing on her a liberal and genteel Education, and ſhe herſelf ſedulous to improve both; ſo that ſhe is now not more conſpicuous for perſonal Charms and Beauty, than great and amiable for her ſingular good Senſe and Judgment, in natural Sciences eſpecially; on which Account ſhe is admired, eſteemed and beloved by all Gentlemen of Diſcernment. This fine Lady, you will eaſily judge, muſt be a notable Contraſt to *Thelia*, Daughter of *Philargus*, who, being of a ſordid and contracted Temper, has beſtowed no more Education on his Daughter than Marking, and making of Paſties; thus *Thelia* lives admired by yeomanly Boors.

Euphroſ. Indeed 'tis Pity there are ſo many young Ladies in *Thelia*'s Caſe; 'tis certainly more their Parents Fault than their own: *Thelia* might have been *Euprepia*, had *Eugenius* been *Thelia*'s Father. 'Tis our Part, *Cleonicus*, to bleſs God, that we had no *Philargus* to our Parent.

Cleon. 'Tis juſtly obſerved, *Euphroſyne*, and I often do: 'Tis our Happineſs that we have Parents whoſe Fortune enables, and whoſe Temper inclines them to beſtow on us Education, and to train us up to truely honourable and polite Life. I have all the Advantages of the Univerſity, and you of the Boarding-School; while I purſue the ſeveral Studies of the *Latin*, *Greek*, and Mathematical Literature, you apply to *French*, and the delightful Acquiſitions of the *Belles Lettres*.

Euphroſ. Dear *Cleonicus*, 'tis indeed my Happineſs to have divers Maſters and Tutors, as well as you; of one I learn *French*, of another to draw, a third teaches me Muſick, and a fourth Dancing: But among 'em all, there's none well enough ſkill'd in Philoſophy to teach that in our School, were any of the young Ladies diſpoſed to learn; this I have learned by Enquiry of my Miſtreſs.

Cleon. As for *Maſters in Philoſophy*, 'tis a thing as yet unheard of in private Schools; in the Univerſities there are indeed *Profeſſors of Philoſophy*, who ſometimes read Lectures on that Subject; but ſince I have the Pleaſure to find in you a Diſpoſition to Philoſophizing, I muſt tell you, that the only Way, at preſent, to learn Philoſophy is from Books well wrote on that Subject. And then——

Euphroſ. But, give me leave to interrupt you a little, by aſking you a Queſtion; tho' indeed I am deſtitute of a Maſter, I am not of Books; my Father's Library, repleniſhed with the choiceſt Books on that Subject, is always, you know, at my Command: But then, this conſtant Difficulty occurs, that they are, for the moſt Part, unintelligible, by reaſon either of Schemes, or hard Terms, or abſtruſe Reaſonings, &c. Pray how am I to be relieved, or aſſiſted in ſuch a Caſe without a Maſter?

Cleon. Dear Siſter, 'tis the Fate of that Science to be attended with ſome Difficulties in the Study of it; theſe are no otherways to be removed than by the Aſſiſtance of learned Men and Books. But thoſe Parts of Philoſophy which are perplexed with Schemes and Abſtruſities, are generally ſuch, as may be either wholly neglected as uſeleſs to the generality of People; or elſe may be explained in a more eaſy and familiar Manner by Experiments. Fear not, *Euphroſyne*, the greateſt and moſt delightful Part of this Science is within the Ladies Comprehenſion.

Euphroſ. You give me good Encouragement, Brother; I wiſh you may find the Succeſs of my Enquiries anſwerable; for I can aſſure you, I ſhall aſk you many impertinent Queſtions on this Subject before you return again to College.

Cleon. Not more, my dear *Euphroſyne*, than I ſhall be as glad to anſwer, if I can; but don't call 'em impertinent; or elſe know, that, in the Sciences, ſuch Impertinencies are the firſt Steps to Knowledge.

Euphroſ. Dear *Cleonicus*, you are very obliging; but ſuffer me to diſcover to you one Thing farther——

Cleon. Yes, dear Siſter, I'm impatient to hear you.

Euphroſ. Be aſſured, then, that ſome Time before you came Home, while yet the happy Moments were near approaching, I had formed, to myſelf, a Reſolution to purſue the Studies of Philoſophy, in ſomewhat of a Method, under your Inſtructions when preſent with us.——'Tis only to you, my *Cleonicus*, I may thus ſpeak without bluſhing.

Cleon. Modeſty, a moſt amiable Virtue in all, ſhould never be an Obſtacle to the forming, or proſecuting, any great, noble, or laudable Deſign; 'tis then a Fault only, when Ambition is a Virtue. I am extremely pleaſed to underſtand your Purpoſe, and ſhall be glad to aſſiſt you all I can.

Euphroſ. Indeed I deſign to make a direct Buſineſs of it, while you are here; and therefore you may expect me to be as troubleſome as you pleaſe.——'Twill be beſt making Hay while the Sun ſhines.

Cleon. All Opportunities and Occaſions ſhall be employed to oblige a Siſter ſo dear to me as *Euphroſyne.* The Severities of Winter are now paſt; the Days are lengthening, the Sun renews his Warmth and Splendor, the Trees begin to bud, the Birds to ſing, and all Things now appear in the Serenity of a returning Spring; I therefore propoſe to ſpend thoſe vernal Evenings in familiar Diſcourſe on natural Things, while we walk round the Park, or over the Fields and Meadows, which make ſuch a delightful Landſcape all about us.

Euphroſ. If I miſtake not, this is ſomewhat like the Manner in which the Ancients taught and learned Philoſophy, is it not?

Cleon. Yes; and you have read at the ſame Time, that *Ariſtotle* and his Diſciples were called *Peripatetics*, from their Cuſtom of teaching and diſputing as they *walked.*

Euphroſ. I have alſo read of that Sect called *Academiſts*, but have forgot on what Account they have that Name.

Cleon. You will eaſily recollect, that it was from a Place called *Academia*, a pleaſant Grove at *Athens*, in which *Plato*, and his Followers, taught Philoſophy.

Euphroſ. I have not read much on the ancient Philoſophy, but I ſuppoſe that muſt needs come far ſhort of the Modern.

Cleon. Very far ſhort, indeed; the Difference is not much greater between Dreaming and Reaſoning; between the crepuſcular and the Noon-tide Light. The *Platonics* taught little more than ſome faint Notions of the *Deity*, which they called *Theology*; and the Doctrines of *Virtue* and *Manners*, which they called *Ethics*, or *Moral Philoſophy*. Soon after *Ariſtotle* enquired into the Cauſes and Nature of Things, but made no great Diſcoveries, as being deſtitute of the proper Means, *viz.* Inſtruments and Experiments; for which Reaſons, that Science which is properly called *Phyſics*, or *Natural Philoſophy*, was brought to no Perfection 'till within theſe 200 Years, or, I may more juſtly ſay, 'till within theſe laſt 50 or 60 Years.

Euphroſ. Indeed I have often obſerved in the little Compaſs of my Reading, that many great and uſeful Inventions have been aſcribed to ſeveral modern Names, as *Bacon*, *Boyle*, *Libnitzs*, *Newton*, *Boerhaave*, *Halley*, &c. and have as often wondered how thoſe Things ſhould remain undiſcovered ſo long.

Cleon. The true Reaſon was, as I ſaid, for Want of a right Method of Philoſophizing, and proper Means to conduct them in their Purſuits; add to this, their Pride and Arrogance would not ſuffer them to appear ignorant of any Thing, and conſequently (not daring to appear in a Poſture of Enquiry) they knew little or nothing of the true Nature of Things. 'Twas my Lord *Bacon's* great Soul which firſt pointed out the Way to real Knowledge, and the Hon. Mr. *Boyle* indefatigably purſued it in numberleſs Experiments, and diſcovered the true Nature of the Air. Sir *Iſaac Newton*, Dr. *Wallis*, &c. firſt improved the mechanical and mathematical Parts, and brought Aſtronomy to its greateſt Perfection. The learned Dr. *Herm. Boerhaave* made great Diſcoveries in Chemiſtry, and the Nature of Plants and Minerals; and Mr. *Lewenhoeck*, that great Improver of the Microſcope, firſt brought to Light the inviſible Parts of Nature; the Theory of the Winds is now well nigh perfected by Dr. *Halley*, lately deceaſed. And laſtly, all the valuable Curioſities, and wond'rous Productions of Nature, are to be ſeen in the unparallelled Collection of the late Sir *Hans Sloane*, and in the Muſeum of the Royal Society.

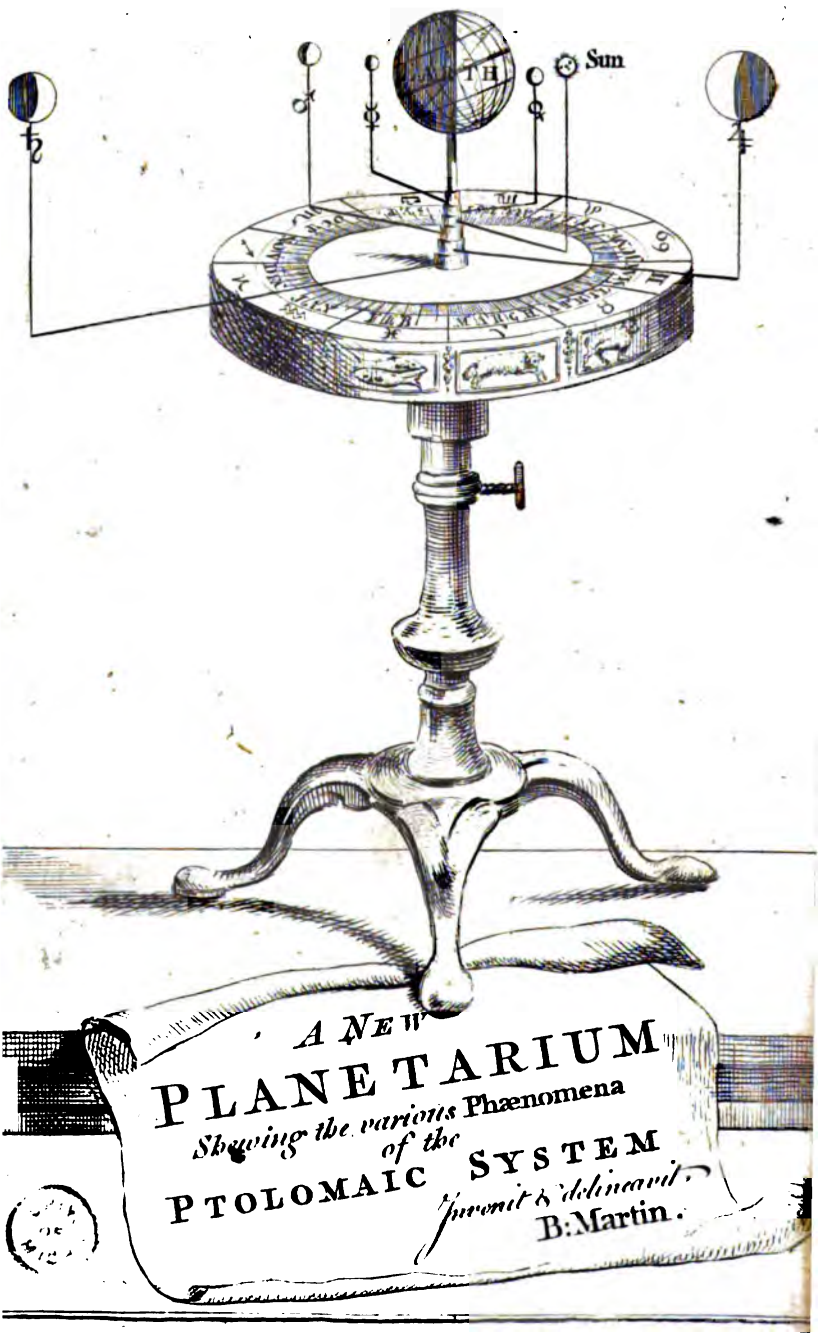
Euphroſ. Since you mention the Royal Society, pray let me aſk you one Queſtion: What are thoſe called the *Tranſactions* of the Royal Society, I have never yet ſeen them, though I meet with perpetual References to them in every modern Piece of Philoſophy?

Cleon. They are a Sort of Regiſter or Journal of all the notable Experiments, Diſcoveries, Enterprizes, learned Diſcourſes, *&c.* which are conſtantly made by the Members of that Society at their ſeveral Meetings; and which are publiſhed in particular Numbers for the Promotion of Natural Knowledge, and the various Arts and Sciences among Mankind. Theſe Numbers are now very many, but are abridged by ſeveral Hands, for more general Uſe; and as they are the Treaſury of natural Science, I deſign to make you a Preſent of them, to aſſiſt and encourage you in your intended Studies therein.

Euphroſ. Dear *Cleonicus*, your Kindneſſes to me are ſuch as I can never requite, but with the ſincereſt Love and Eſteem; they endear you to me in all the Characters of a Brother, a Friend, and a Tutor. But, as the Evening is now well ſpent, let us defer our farther Thoughts to the next convenient Seaſon.

Cleon. 'Tis true, my *Euphroſyne*, the Night, and Nature, calls us away to reſt. The next Time we diſcourſe of theſe Matters, we will take a regular Method of contemplating Nature; ſurvey firſt the *Heavens*, then the *Air and its Meteors*; after that, we will take a View of the Earth on which we live, and all its various Productions; and laſtly, we will recreate ourſelves with the delightful Diſcoveries of the Microſcope, and other curious Inſtruments by which Philoſophy has arrived at its preſent great Perfection. In the Courſe of theſe Meditations, we ſhall (in the Words of Sir *R. Blackmore*)

See thro' this vaſt extended Theatre,
Of Skill divine, what ſhining Marks appear!
Creating Pow'r is all around expreſt,
The God diſcover'd, and his Care confeſt;
Nature's high Birth her heav'nly Beauties ſhow;
By ev'ry Feature we the Parent know.
Th' expanded Spheres, amazing to the Sight,
Magnificent with Stars and Globes of Light;
The glorious Orbs which Heav'n's bright Hoſt compoſe,
The impriſon'd Sea, that reſtleſs ebbs and flows;



A NEW
PLANETARIUM
Showing the various Phænomena
of the
PTOLOMAIC SYSTEM
Invenit & delineavit.
B:Martin.

The fluctuating Fields of liquid Air,
With all the curious Meteors hov'ring there,
And the wide Regions of the Land proclaim
The Pow'r divine that rais'd the mighty Frame.
Creation. *Pag.* 5.

DIALOGUE II.

Of the UNIVERSE, *and the ſeveral* SYSTEMS *of the* WORLD.

Cleonicus.

I Gueſs at your Wiſhes, Siſter; this fine Day terminates in a fair and delightful Evening, which invites us to the Pleaſures of a Walk; you are ready to go, but which way are you inclined to take, the Park or the Fields, or along the winding Lanes?

Euphroſyne. The Park this Evening, if you chuſe it, Brother.

Cleon. With all my Heart, *Euphroſyne*; come on, and while we take a Tour about the large extended Plain, aſk me any Queſtions your Curioſity may ſuggeſt, and I'll endeavour to anſwer them the beſt I can.

Euphroſ. I thank you, *Cleonicus*; I remember when we laſt diſcourſed together, you promiſed me a regular Account of natural Things, and ſaid we ſhould begin with the *Heavens*; this ſeems an ambiguous Term to me, pray, what do the Philoſophers mean by *the Heavens?*

Cleon. They ſometimes mean, the Sky or Firmament; ſometimes the Orbits of the Planets; ſometimes the Space of one Syſtem, and ſometimes of all the Syſtems in the Univerſe.

Euphroſ. That I may have a yet clearer Idea of what you intend, I muſt beg you to explain the Terms *Univerſe*, *Syſtems*, *Space*, &c. for I would willingly underſtand Things aright.

Cleon. By the *Univerſe*, my *Euphroſyne*, you are to underſtand the whole Creation of all Things, together with the every Way infinitely extended Space or Void in which they have their Exiſtence.

Euphroſ. If, as you intimate, the Univerſe be infinite, how do you think it is furniſhed in the ſeveral Parts thereof; or is it all an empty Space beyond the Stars?

Cleon. The Philoſophers of the preſent Age teach us, that the Univerſe, through all the boundleſs Space, is repleniſhed with Syſtems or Worlds of different Bodies. For by a *Syſtem*, they mean a Number of Bodies which move about one common Center or Point; and ſuch a Syſtem is what we call a *World*; and the moving Bodies of theſe Syſtems, we call *Planets* and *Comets* in ours.

Euphroſ. Do the Philoſophers know any thing of the ſeveral Syſtems or Worlds beſides our own?

Cleon. Not any Thing certainly; they only make probable Conjectures at moſt, and reaſon from the Analogy they obſerve between ſome things in our Syſtem, and ſome in theirs, which they think alike; of which I ſhall be more particular when we talk of the Stars.

Euphroſ. You know beſt, dear *Cleonicus*, how to direct my Enquiries; I am content therefore if I can but obtain a general Knowledge of our own World; but what did you ſay, that all the Bodies of our World were moveable about a Center?

Cleon. Yes, all but one; and that one is it, which poſſeſſeth the Center or middle Point of the Syſtem.

Euphroſ. Before I can aſk you a Queſtion I intend, you muſt, *Cleonicus*, tell me how many Bodies there are which compoſe our Syſtem or World?

Cleon. Thoſe whoſe Number is certain, are of the larger Sort, Six; *viz.* *Mercury*, *Venus*, the *Earth*, *Mars*, *Jupiter* and *Saturn*, beſides the *Sun*, which is far greater than them all. But thoſe Bodies we call *Comets*, or *Blazing-ſtars*, are ſtill more, tho' uncertain in Number. Beſides all theſe, there are a leſſer Sort of Bodies in our Syſtem which move about the larger, and they are called *Satellites*, or *Moons*, of which we can ſee but one with the naked Eye.

Euphroſ. But, dear *Cleonicus*, are not the Stars which twinkle all about us, and light us through gloomy Nights, a Part of our Syſtem?

Cleon. No; the Reaſon of which you will underſtand by-and-by.

Euphroſ. Then the Queſtion I would aſk, is; which of all thoſe Bodies you mention is That which remains at reſt in the Center of the Syſtem?

Cleon. That is the Queſtion, indeed; you will not a little wonder, perhaps, to hear, that the moſt learned Philoſophers have been controverſing this Point for above 2000 Years; Schools have diſputed with Schools; and many, and different Syſtems have been formed to ſolve the Appearances and Motions of the heavenly Bodies.

Euphroſ. I have read, I remember, of the Syſtems of *Ptolomy*, *Tycho*, and *Copernicus*; I ſuppoſe you mean theſe among the reſt, do you not, *Cleonicus?*

Cleon. Yes, my *Euphroſyne*, thoſe which you mention are the Principal; beſide which there were ſome others, as of *Kepler*, *Deſcartes*, *&c.* from ſuch a Variety of Notions, Sir *Richard Blackmore* ſays,

The old and new Aſtronomers in vain
Attempt the heav'nly Motions to explain.

But here Sir *Richard* was miſtaken; for the new Aſtronomers have very ſucceſsfully explained the heavenly Motions in every Reſpect.

Euphroſ. Tho' it may not be to much Purpoſe to have a large Account of all theſe Syſtems, yet I ſhould be glad juſt to know what they were, and how they differed from each other, in as few Words as you can.

Cleon. The Syſtem of the famous *Egyptian* Aſtronomer, *Ptolomy*, was the moſt groſs and vulgar: He ſuppoſed the Earth poſſeſſed the Center of the World, and that about it moved, firſt the Moon, then *Mercury*, then *Venus*; then the *Sun*; then *Mars*, *Jupiter* and *Saturn*; all in Orbs above each other; next above *Saturn* he placed the Firmament of the fixed Stars; and above theſe, two ſolid cryſtalline Spheres, one moving from Eaſt to Weſt, the other from North to South, and *vice verſâ*. All theſe he included in that Sphere he called the *Primum Mobile*, or firſt Mover, which, by a daily Motion about its Axis, carried the inferior Orbs from Eaſt to Weſt once in 24 Hours. But this Hypotheſis was far from ſolving the Appearances of the heavenly

Motions, and therefore is deſervedly thus cenſured by the aforeſaid Gentleman.

> *Firſt* Ptolomy *his Scheme celeſtial wrought,*
> *And of Machines a wild Proviſion brought.*
> *Orbs* centric *and* eccentric *he prepares,*
> Cycles *and* Epicycles, *ſolid Spheres,*
> *In order placed, and with bright Globes inlaid,*
> *To ſolve the Tours by heavenly Bodies made.*
> *But ſo perplex'd, ſo intricate a Frame;*
> *The later Ages with Deriſion name.*

This Syſtem you have repreſented in the Diagram I have drawn for you, (*Plate* I. *Fig.* 1.) and is evident by Inſpection only.

Euphroſ. It is ſo; it is the Figure of the Heavens, which I have ſeen in every common Map. But ſince *Tycho* diſapproved of *Ptolomy*'s Syſtem, I ſuppoſe he advanced one more plauſible; pray, what was peculiar to his?

Cleon. 'Tis ſaid, he placed the Earth in the Center of the Syſtem, and gave it only a diurnal Motion about its Axis once in 24 Hours; tho' ſome ſay, he made the *Earth* to be abſolutely at reſt. About the Earth he revolved the *Moon*, and alſo the *Sun*; but then about the Sun he placed the Orbs of *Mercury*, *Venus*, *Mars*, *Jupiter* and *Saturn*; ſo that they revolve at the ſame Time about the Earth once in a Year. Thus Sir *Richard*:

> *The famous* Dane, *who oft the* Moderns *guides,*
> *To Earth and Sun their Provinces divides;*
> *The Earth's Rotation makes the Night and Day;*
> *The Sun, revolving thro' the ecliptic Way,*
> *Effects the various Seaſons of the Year:*
> *Which, in their Turn, for happy Ends appear.*

This enormous Conſtruction of a Syſtem of the World I have repreſented alſo in a Scheme, for your more eaſy apprehending it. (*Fig.* 2.)

Euphroſ. I am obliged to you for it, as it is not quite ſo eaſy to get an Idea of it without. This Scheme of the Heavens, if I remember

member right, is alſo exploded; but I forget the particular Reaſons thereof.

Cleon. Becauſe in this, not only ſingle Planets, but a whole Syſtem is made to revolve about the Earth every Year; which is an Effect ſo prodigious to anſwer an End much eaſier brought about by a more ſimple and natural Contrivance, that it has been juſtly rejected by the *Moderns*, who all agree to admit the *Copernican* Syſtem as the only true and genuine one, of which we will hereafter diſcourſe more particularly.

DIALOGUE III.

Of the fallacious Reaſoning on which the PTOLOMAIC HYPOTHESIS *depends.*

Cleonicus.

WE laſt Night had a pleaſant Walk, in which I gave you a general Account of the *Ptolomaic* and *Tychonic* Syſtems; and as this Evening is like to prove very ſerene, if it be agreeable to you to take a Walk (after Tea) to the *Villa* beyond the Park, we will re-aſſume the Subject of the *Ptolomaic Syſtem*, and conſider a little more nicely the Merits of it.

Euphroſ. With all my Heart, *Cleonicus*; and I ſhould be glad to know the particular Reaſons why this Syſtem comes into ſuch Diſcredit among the Learned, when it ſeems, for the moſt part, agreeable to the Senſes, and is often mentioned in the Holy Scriptures.

Cleon. Neither of thoſe Arguments you now mention, my *Euphroſyne*, have any Weight with Gentlemen of Learning, nor yet with Ladies of good Senſe; and you'll find yourſelf able, with a little Reflection, to ſee they are not only abſurd, but even ridiculous; for you may as well think every Thing *true* you hear, as that every Thing is *juſt as* you ſee it.

Euphroſ. If we are not to believe our Senſes, *Cleonicus*, pray, why were they given us, and by what are we to be informed?

Cleon. Our Senſes are the general Means of Information, but they are all deceptive in ſome Meaſure; none more ſo than the Sight. My dear *Euphroſyne*, you will find it a dangerous Thing to truſt your *Eye-ſight* too far; our rational and diſcerning Faculties were given us for rectifying the Ideas of Senſes, and to diſcover Truth from Error. And herein conſiſts our Pre-eminence above Brutes. But to come nearer the Point. To ſuppoſe the *Earth at Reſt, only becauſe it appears to be ſo*, is the weakeſt Thing a Perſon can be capable of that pretends to any Reaſon at all.

Euphroſ. Why, *Cleonicus*, you ſeem very ſerious, and almoſt warm; if People are deceived by their Senſes, and impoſed upon by their Profeſſors, how can they help it?

Cleon. Very eaſily, my *Euphroſyne*, let them think and reaſon, and they will not be any longer the Dupes of Error and Impoſture. A common Sailor, who has little Reaſon enough in moſt of his Actions, would yet be aſhamed of ſuch an Abſurdity, as to conclude his Ship was at Reſt, becauſe it appears to be ſo to every one within it. And therefore, Siſter, when you are diſpoſed to take a Voyage to *France*, you will have an Opportunity of being convinced that Bodies in Motion will appear to be at Reſt, and Objects at Reſt appear to move, and ſo you will have no farther Difficulty in that Affair.

Euphroſ. Dear *Cleonicus*, I hope you will find ſome more agreeable Way to convince me, than by ſending me to Sea; for though I ſhould like to make the Tour of *France*, and to acquire philoſophical Experience in the Voyage; yet I cannot, by any Means, think of the terrible Element of the Ocean.

Cleon. Well, though it might anſwer a very good Purpoſe for you to ſee *Paris*, eſpecially as you might then convince the *Madames*, that the *Engliſh Ladies* excel them as much in Genius and Faculties of the Mind, as They do them in the Frippery of Dreſs, and perſonal Decorations: Yet, to ſave you all this Trouble, we need only take a walk to yonder Hill, and our Purpoſe will be anſwered every whit as well.

Euphroſ. Indeed! *Cleonicus*; I ſhall gladly chuſe that Method rather than the other; but, pray, what curious Spectacle will there offer to confute ſuch a general Argument?

Cleon. Come with me, and you will ſoon ſee, my *Euphroſyne*:—You obſerve a Wind-mill is there placed on an elevated Ground, and that there is a Ladder by which you aſcend to the

Door.—Do you go up, and I will follow, when I have ſpoke a Word to one of the Millers.—Well, I ſee you are ſeated, and ſurveying the ſeveral Parts of the Machine; pray, how do you like being in a Wind-mill?

Euphroſ. Very well; I never was in one before; there is ſomething novel and ſtrange in the Structure, and I am greatly entertained with the Oddity of my Situation; but what amuſes me moſt of all is, the *Motion* of that large ſquare upright Poſt; ſee, how faſt it moves round!

Cleon. The Poſt move, Siſter; I ſee no Motion of a Poſt.

Euphroſ. Not ſee the Poſt move, *Cleonicus!* What has happened to you all at once, I hope you are not blind, can you ſee me?

Cleon. Yes, my *Euphroſyne*, with Pleaſure I ſee, and hear you too; but I ſee no Poſt move, really.

Euphroſ. Well, this is the moſt wonderful Thing I ever knew; for it has continued to move ever ſince I have been ſpeaking to you about it, and I never ſaw any Thing plainer in my Life than I ſee it move now. How is it, Brother, that you cannot ſee it likewiſe? I am amazed!

Cleon. You'll be further ſurprized, *Euphroſyne*, when I tell you, that though I ſee no Poſt move, I ſee the Mill itſelf move, and that I ſuppoſe is more than you can ſee; is it not ſo?

Euphroſ. Truely it is; the Mill move! I ſhould not have thought of it, *Cleonicus.* I ſit as perfectly at Reſt here as I do in the Parlour at home, and ſee no Motion in any Thing but the Poſt; or is it all Enchantment? But hold, I recollect what you ſaid by the Way; I believe I have diſcovered the Plot.

Cleon. I dare ſay you have; the End of your coming here is very well anſwered. You hereby ſee how very *fallacious the Sight is*; you ſaw the Poſt in Motion, and the Mill at Reſt, as you thought; but now look out at this little Window, *Euphroſyne*, and you'll ſee the whole Reaſon of ſuch a ſtrange Illuſion; obſerve *Rotato* the Miller, by means of that ſtrong Lever, turning the Mill round its Axle, or upright Poſt, which, when you go down, you'll ſee is fixed immoveably in the Earth; this they always do to ſet the Sails againſt the Wind. And this *real Motion* of the Body of the Mill cauſes that very curious, and indeed, wonderful apparent Motion of the *Swivel-poſt.*

Euphroſ. I am perfectly convinced by this Inſtance of the *Deception of Viſion*; I could never have thought it was poſſible in ſo great a Degree: I ſhall hence-forward have Reaſon to be more diffident, or leſs poſitive, with reſpect to common Notions and ſenſible Appearances.

Cleon. Very good, my *Euphroſyne*, it was for theſe Purpoſes I brought you hither. You will now readily grant the Earth may appear to be at Reſt, and yet really move, and that the *daily Motion* of the *Sun*, *Moon*, and *Stars* may not be *real* but *apparent*.

Euphroſ. I am fully ſatisfied upon that Head:—But what muſt I reply to thoſe who ſo religiouſly object the Scriptures mentioning the *Motion of the Sun*, and the *Earth at Reſt?*

Cleon. Very little will ſuffice for an intelligent Perſon, and there is no reaſoning with others.—As the Pen-men of the Scriptures never deſigned to give us a Syſtem of *Philoſophy*, or *Aſtronomy*, (which very probably they none of them underſtood rightly) ſo they every where accommodated their Diſcourſe and Manner of ſpeaking to the common Underſtanding and Apprehenſions of the Vulgar. And indeed, it would be extremely abſurd to act otherwiſe. Sir *I. Newton* always ſaid the *Sun roſe and ſet*; and had he been in *Joſhua*'s Place would have ſaid as he did—*Sun, ſtand thou ſtill*, &c. Beſides, how weakly do we argue from the *literal Expreſſion of Scripture?* Does it not ſay, in one Place, *that the Earth is ſupported by Pillars?* And in another, that he (*viz.* God) has *hung the Earth upon nothing?* How contradictious are ſuch Expreſſions! And indeed, this Method of treating the Scriptures is not only injurious to the Sciences, but even to Religion itſelf.

Euphroſ. You have ſaid enough to ſatisfy me upon that Head, *Cleonicus*; and as it is far in the Evening, and we have a long Walk over the Park, let us ſet out; and when we come home, I ſhall be farther inquiſitive about this Matter.

Cleon. As much as you pleaſe, Siſter; I fear it will be too cold for you; put the beſt Foot foremoſt, and we ſhall ſoon be at home.

Euphroſ. I do not think of the Cold; my Head is employed about the Mill;—but, among all the bright Stars that light us home, how many Planets do you ſee, *Cleonicus?*

Cleon. There are no leſs than three which offer themſelves this Evening to the View, but one of them (*i. e. Mercury*) is now ſet; the bright *Evening-ſtar*, which you ſee low in the weſtern Hemiſphere, is the Planet *Venus*; and that pale-faced Planet which you ſee yonder, *South by Eaſt*, is *Saturn*; and all the reſt are *fixed Stars.*

Euphroſ. So the *Evening-ſtar*, that every Body takes ſo much Notice of, is a *Planet*, I find; pray, *Cleonicus* how am I to know a Planet form a Star at any Time?

Cleon. Very eaſily, Siſter, two ways; one is, that every fixed Star *twinkles*, but a Planet never does.

Euphroſ. Indeed; pray what can be the Reaſon of that, *Cleonicus*?

Cleon. The Stars are only *lucid Points* to Appearance, and therefore any opake Atom, or Particle, floating in the Air, is ſufficient to *eclipſe*, or cauſe a *momentary Occultation* of them; and this, joined with the Agitation or Tremours of the Air, will cauſe that conſtant Twinkling in the *Stars* which you ſee: But the Planets, though ſmall, are ſtill bigger than thoſe Motes to the Eye, and therefore their Light will ſuffer little or no *Diminution.*

Euphroſ. Very good; and what is the ſecond Thing that diſtinguiſhes a Planet from a Star?

Cleo. This, my *Euphroſyne*, is the proper *Criterion* or Characteriſtic of a *Planet*, namely, a Planet is always in Motion from one Part of the Heavens to another, and from thence it is called a *Planet*, which in *Greek* ſignifies a *wandering Star*; now the other Stars are all fixed, and keep the ſame Diſtances conſtantly from each other.

Euphroſ. Dear *Cleonicus*, you have thoroughly prepared me to diſtinguiſh the Planets from the Stars.—I have one more Queſtion to aſk you, and that ſhall be all for To-night; what is the Sky or Firmament? And why does it appear always of that equally round Form?

Cleon. The Sky, my *Euphroſyne*, is not any Thing real, but only the *apparent Boundary of our Sight*; Space is every Way infinitely extended; but our Sight is terminated all around us, at a ſmall, but equal Diſtance; and this is the only Reaſon why the Firmament appears of a perfectly ſpherical, concave Figure;

gure; for the Surface of a Sphere is every where equally diſtant from the Center, and every Man's Eye is the Center of his View; could he ſee farther one Way than another, the Heavens would appear of an irregular Form, and quite different from that beautiful Hemiſphere, or azure Canopy, which conſtantly repreſents itſelf to our View.

Euphroſ. Well, *Cleonicus*, how happy it would be if every Walk I took for the future were to prove ſo delightful and inſtructive as this! But ſee,—the Candles are lighted, and Supper, I ſuppoſe, on the Table; we are at Home juſt in Time.

Cleon. We are ſo; but we will now ſolace ourſelves with the Refreſhments of kind Nature, and To-morrow re-aſſume this Subject; for many Things remain for my *Euphroſyne* yet to underſtand.

DIALOGUE IV.

A View of the demonſtrative Proofs of the FALSITY *of the* PTOLOMAIC HYPOTHESIS, *as repreſented in a* NEW PLANETARIUM.*

Euphroſyne.

THIS Morning, *Cleonicus*, I remember you told me we ſhould be employed in a more particular Conſideration of the *Ptolomaic Syſtem*; pray, in what Reſpect do you mean?

Cleon. I mean, my *Euphroſyne*, to point out to you thoſe particular *Phænomena* of the Heavens, which are eaſy to be obſerved by yourſelf, or any one, and which do of themſelves ſeverally evince the abſolute Falſity of the aforeſaid Syſtem; and you'll not be diſpleaſed to have it eaſily in your Power to refute an Hypotheſis in half an Hour, which has been univerſally and ſtrenuouſly maintained for Ages paſt.

Euphroſ.

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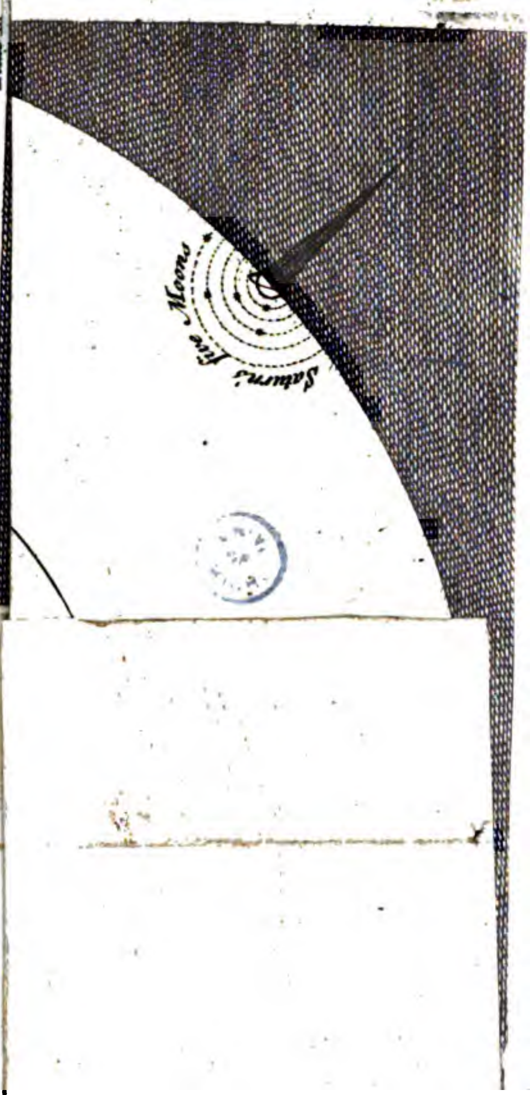
* The Reader, through this whole Dialogue, is to ſuppoſe, that the *Ptolomaic* Syſtem is repreſented by a new *Planetarium* with all the planetary Bodies, together with the Sun, revolving about the Earth at Reſt in the Center; which Machine is repreſented in a general Manner in *Plate* II.



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Euphroſ. I plainly ſee it is impoſſible; becauſe their Orbits are both contained within the Orbit of the Sun. But are they ſeen at any Time to go beyond the Sun, *Cleonicus?*

Cleon. Yes, juſt as often as on this Side of it; as we ſhall have an Opportunity of obſerving ſoon.

Euphroſ. Such an Appearance will give me great Pleaſure, and be an undeniable Argument of the Falſity of this Syſtem.

Cleon. But you will find a ſecond Proof of the ſame Thing more flagrant, if poſſible, than the firſt.—For you ſee the Sun, there, in the *Weſt*, Siſter;—and if you look here, you will ſee the Planet *Mercury* in the *Eaſt*.—And, again, there you ſee the Planet *Venus* in the *South*.—Now theſe are ſuch Aſpects and Poſitions of the Planets as never were ſeen by any Man.

Euphroſ. If I take this Affair right, you mean to ſhew me, that if this were the true Syſtem, I might ſee (juſt after *Sun-ſet*, in a clear Evening) the Planets *Mercury* and *Venus* at any Diſtance from the Sun from *Weſt* to *Eaſt*, don't you, *Cleonicus?*

Cleon. That is the very Thing intended, my *Euphroſyne*; but you will eaſily recollect, that inſtead of ſeeing theſe Planets in every Part of the Heavens in a Star-light Evening, you ſeldom ſee them at all; nay, one of them, *Mercury*, ſo ſeldom, that you never yet obſerved it in the leaſt; and the other, *Venus*, or the *Evening-ſtar*, appears very rarely, being always near the Sun, and when fartheſt, not more than about 47°, that is, you never ſaw the ſaid Planet farther from the *Setting-ſun* than about *South-weſt*; you never ſaw it in the *South*, or *Eaſtern* Parts of the Hemiſphere of an Evening, which Phœnomenon does therefore inconteſtably prove the Abſurdity of this Syſtem.

Euphroſ. I am convinced of it thoroughly; I do not know that ever I ſaw the Planet *Mercury*; and as to *Venus*, I never ſaw her but in the Circumſtances you mention. But what is your next Argument againſt this *Hypotheſis?*

Cleon. The Earth being ſuppoſed the Center, the Planets will be in every Part of their Orbits at an *equal Diſtance*, and therefore will appear *equally big* at all Times; but this is contrary to all Appearances; for the *apparent Magnitude* of all the Planets is conſtantly variable: Nay, ſo great is the Difference in *Mars*, that at one Time he appears as large as *Jupiter*, and at another

Time ſo ſmall, that you cannot diſtinguiſh him from a *fixed Star*, but by his red Aſpect.

Euphroſ. If this be the Caſe, it muſt certainly be an indiſputable Argument againſt the *vulgar Hypotheſis.*

Cleon. You will hereafter be fully ſatisfied, by your own Experience, that is really the Caſe; at preſent, that Planet is not in a Situation to be obſerved, but he ſoon will.—I ſhall mention next another irrefragable Argument to the ſame Purpoſe.—You ſee the Planets in this Machine move with an uniform and equal Velocity in every Part of their Orbits.

Euphroſ. I do ſo; they move neither faſter nor ſlower in one Part than another.

Cleon. But this is not the Caſe of the Planets in the Heavens; for they all appear to move there with very unequal Paces; ſometimes they are *very ſlow* in Motion, ſometimes very quick, and ſometimes they appear *ſtationary* for ſome Time, or without any Motion at all. This you may be as eaſily convinced of as you can deſire, in a few Week's Time in the Planet *Venus*, which is now an Evening-ſtar, and very ſlow in moving from one fixed Star to another; but ſome Time hence, you will obſerve, ſhe has *no Motion* at all for ſeveral Days, then after that, you'll ſee her move very faſt back again towards the Sun, and be ſoon loſt in his Blaze. In all which Obſervations, I ſhall take particular Care to aſſiſt you.

Euphroſ. I ſhall be obliged to you, *Cleonicus*; and greatly pleaſed to obſerve ſuch curious Appearances of the Planets; eſpecially as they will afford me ſuch ample Conviction of the Falſity of this Syſtem, which ſhews this, and every Planet moving conſtantly with the ſame even Pace.

Cleon. There remains yet one more Obſervation to prove this Syſtem a moſt groſs and abſurd Hypotheſis, and that is—you obſerve, that a Spectator on the Earth, in the Center, would view all the Planets moving *one and the ſame Way continually*, or from *Weſt* to *Eaſt*; don't you, my *Euphroſyne?*

Euphroſ. Yes, I do very plainly; I am certain, from what I now ſee, that the Planets muſt neceſſarily appear to move as they really do, ſince we are ſuppoſed to be in the Center of their Motions.

Cleon. Very good, Siſter; but if we are not in the Center of their Motions, they cannot then be ſeen to move as they really do; but muſt of Courſe appear to move in a different Manner; and accordingly we always obſerve, that in the Heavens they appear to move ſometimes from *Weſt* to *Eaſt*, ſometimes from *Eaſt* to *Weſt*; and ſometimes to be *ſtationary*, and have no Motion at all.

Euphroſ. I make no Doubt of what you ſay; but you will readily ſuppoſe I am not *Aſtronomer* enough to have obſerved ſo much, *Cleonicus*.

Cleon. If you have not, you eaſily may, my *Euphroſyne*, at any Time almoſt; but at preſent you cannot wiſh for a better Opportunity; for the Planet *Venus* is now moving very ſlowly towards the Stars Eaſtward, therefore, the firſt Star-light Evening, obſerve her Diſtance from the next bright Star on the Eaſt, and you will ſee, in a few Days, that Diſtance will be diminiſhed by the Planet's Approach to the Star.

Euphroſ. Well, that I ſhall ſoon do, and by that Means know ſhe moves Eaſtwards. But what is the next Thing to be obſerved, *Cleonicus*?

Cleon. After you have ſome Time obſerved her Motion Eaſtward, you will find ſhe moves ſlower, by Degrees, till at laſt ſhe becomes *ſtationary*, or without any Motion at all; and this you will perceive by her keeping at the ſame Diſtance from a fixed Star for ſeveral Days together.

Euphroſ. Very good, *Cleonicus*, I ſhall endeavour to do that alſo; and what remains then?

Cleon. After that, Siſter, you will obſerve that ſplendid Planet return again towards the *Weſt*, and with a very quick Motion to meet the Sun, which ſhe will ſoon do; and thus you will obſerve, that ſoon after ſhe begins to be *retrograde*, ſhe is loſt in the ſolar Rays; or ſets *heliacally*, as we call it. Theſe Things you will find are all eaſy to be underſtood with a little Obſervation and Attention; and will be farther illuſtrated by Experiment, when I come to explain to you the beautiful Conſtruction of the *Copernican*, or true Syſtem of the World, in ſome of our future Speculations on theſe Subjects.

Euphroſ. Well, you can't imagine what Satisfaction and Pleaſure it gives me to underſtand how poor and unworthy an Hy-

Hypotheſis that of *Ptolomy* is; how very erroneous, groſs, and fallacious the Principles on which it depends; and how many, eaſy, and convincing Arguments we are ſupplied with, by Nature and common Senſe, to confute it.

Cleon. And, of Courſe, it muſt now appear wonderful to you, that there ſhould be ſo many Retainers to, and ſtrenuous Defenders of this abſurd Syſtem. But what can be ſaid of invincible Ignorance? It is to no Purpoſe to urge the Force of *Senſe* or *Reaſon*, nor even of *Truth* or *Demonſtration* againſt it. And therefore we muſt leave them to the Dominion of Error, and ſtudy only the Inſtruction of the happy few that are capable of Reaſon and Conviction.*

DIALOGUE V.

A Brief Account of the SOLAR SYSTEM.

Euphroſyne.

THE Morning having been advantageouſly ſpent in a Refutation of the *falſe Syſtem*; you are now, *Cleonicus*, indebted to me a few Hours this Afternoon, for an Explanation of the true Syſtem of the World, according to your Promiſe.

Cleon. My Promiſe ſhall be always ſacred, my *Euphroſyne*, and with the greateſt Pleaſure I ſhall now explain to you what is the true State of Nature, with regard to the *Mundane Syſtem* of planetary and cometary Worlds; which has been ſometimes called the *Pythagorean*, ſometimes the *Copernican*, now the *Newtonian*, and then the *Solar Syſtem*.

Euphroſ. Pray, why was it called the *Pythagorean* Syſtem, *Cleonicus*?

Cleon. Becauſe, anciently invented and taught by that famous *Grecian* Sage, *Pythagoras*, and continued ſo to be by his Followers;

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* The ſeveral Phœnomena of the *Ptolomaic* Syſtem, conſidered in this Dialogue, will evidently appear, if the Reader has his Eye upon the Diagram in the firſt Plate (*viz.* Fig. 1.) where the Earth, the Sun, and Planets are ſo placed, as to repreſent them ſeparately and diſtinctly to the View.

but being loſt, in the Ignorance and Barbarity of ſucceeding Ages, it was again retrieved, and maintained by *Copernicus*, about 200 Years ago; and for that Reaſon was called by his Name.

Euphroſ. And becauſe they placed the *Sun* in the Center, it was from thence called the *Solar Syſtem*, I ſuppoſe.

Cleon. You are right, Siſter; and the Appellation of *Newtonian* was given it from its being demonſtrated in every Part by that Prince of Philoſophers, Sir *Iſaac Newton*, who firſt diſcovered the Powers employed by Nature; and by obſerving the Phœnomena, explained and eſtabliſhed by that unerring Rule, all its Laws of Motion. Thus again Sir *Richard:*

The Maſters form'd in Newton's *famous School,*
Who does the Chief in modern Science rule,
Erect their Schemes by mathematic Laws,
And ſolve Appearances with juſt Applauſe.

Euphroſ. Very *a-propos*, my *Cleonicus*; I find you are a *Newtonian* every Inch of you.

Cleon. Yes, and I expect to ſee you proſelyted to this, not more modiſh than true Philoſophy, before we leave the Subject. I can tell you, Sir *Iſaac* has no ſmall Party among the Principal of the *Fair Sex*.

Euphroſ. I'm glad to hear it; I ſhall readily make one of the Number, if his Philoſophy be the beſt; but I beg leave firſt to underſtand it, if I can, *Cleonicus*.

Cleon. Your Requeſt is very rational; one Proſelyte of the Underſtanding is worth twenty of meer Faith in Philoſophy. I ſhall endeavour to give you a juſt Idea thereof, and its ſeveral Parts, by a Scheme which I have drawn up for that Purpoſe, and which is nearly a true Repreſentation of the *Solar Syſtem*, in which you ſee the Sun poſſeſſes nearly the central Point, for Reaſons we ſhall hereafter mention. By the *central Force*, or Power of Gravity, in the Sun, compounded with a projectile Force, there are found to revolve the *ſix Planets* following, *viz.* the firſt, or neareſt Planet to the Sun is *Mercury* ☿; the next is *Venus* ♀; the third is the *Earth*, with her *Moon*; the fourth is *Mars* ♂; the fifth *Jupiter* ♃; the ſixth and laſt is *Saturn* ♄; theſe all move about the central Sun in different Spaces or Periods of Time, and in Orbits that are very nearly circular, or ſuch as repreſented in this Scheme.

Euphroſ. I obſerve you have made the Orbs of the Planets circular, but the Orbit of a Comet, I ſee, you have repreſented as Part of a very long *Oval:* Do all the Comets go round the Sun in ſuch oval Figures?

Cleon. Yes, my *Euphroſyne*, they all move in Orbits, which are more or leſs oval, or (as the Aſtronomers call it) *Elliptical*; for what you call an *oval Figure*, they always call an *Ellipſis*.

Euphroſ. The Learned, 'tis fit, ſhould be allow'd to ſpeak in a Phraſe above what is vulgar; but I take it then only as uncivil or ungenteel Uſage, when they amuſe us with unintelligible Terms; ſince we ought always to underſtand what is offer'd us to read. But this by the Way; pray *Cleonicus*, what do you intend by thoſe ſmall Stars round *Jupiter* and *Saturn*, in the Scheme?

Cleon. They are little Moons, which the Aſtronomers call *Satellites*; theſe light thoſe diſtant Planets thro' their dreary Way; while others which are nearer the Sun, and have therefore a greater Degree of Light, have none of them, ſave our Earth only, which has but one.

Euphroſ. Theſe, I preſume, are all the great Bodies which compoſe our Syſtem, becauſe I ſee no more in the Scheme; but pray, what have you done with all the Stars? Do none of them fall to the Share of our World?

Cleon. They are all at a vaſt Diſtance from our Syſtem, and make no Part of it; as you will ſee hereafter. You will caſt your Eye on the Diagram once more, and obſerve, that the Bulks, or Magnitudes of the Sun and Planets are there alſo repreſented.

Euphroſ. I ſee it, I believe; does not the *Orb of Saturn* repreſent the Face of the Sun, and the ſeveral other white Globes the comparative Bigneſs of the Planets whoſe Names they bear?

Cleon. Yes, my *Euphroſyne*, they do; they are here drawn in Proportion to the Sun, of more than eight Inches in Diamater, and from thence you obſerve how ſmall a Figure even the largeſt of them all makes in Compariſon of that glorious, central, ſolar Globe.

Euphroſ. Small indeed! I am almoſt aſhamed for our Earth; really 'tis ſcarce viſible in the Syſtem. Heavens! what a Buſtle do we Mortals, make about this Globe of Earth, when we ſee and conſider it alone; but how little a Thing does an Empire or Kingdom, nay, the Earth itſelf appear, compar'd with the whole Syſtem.

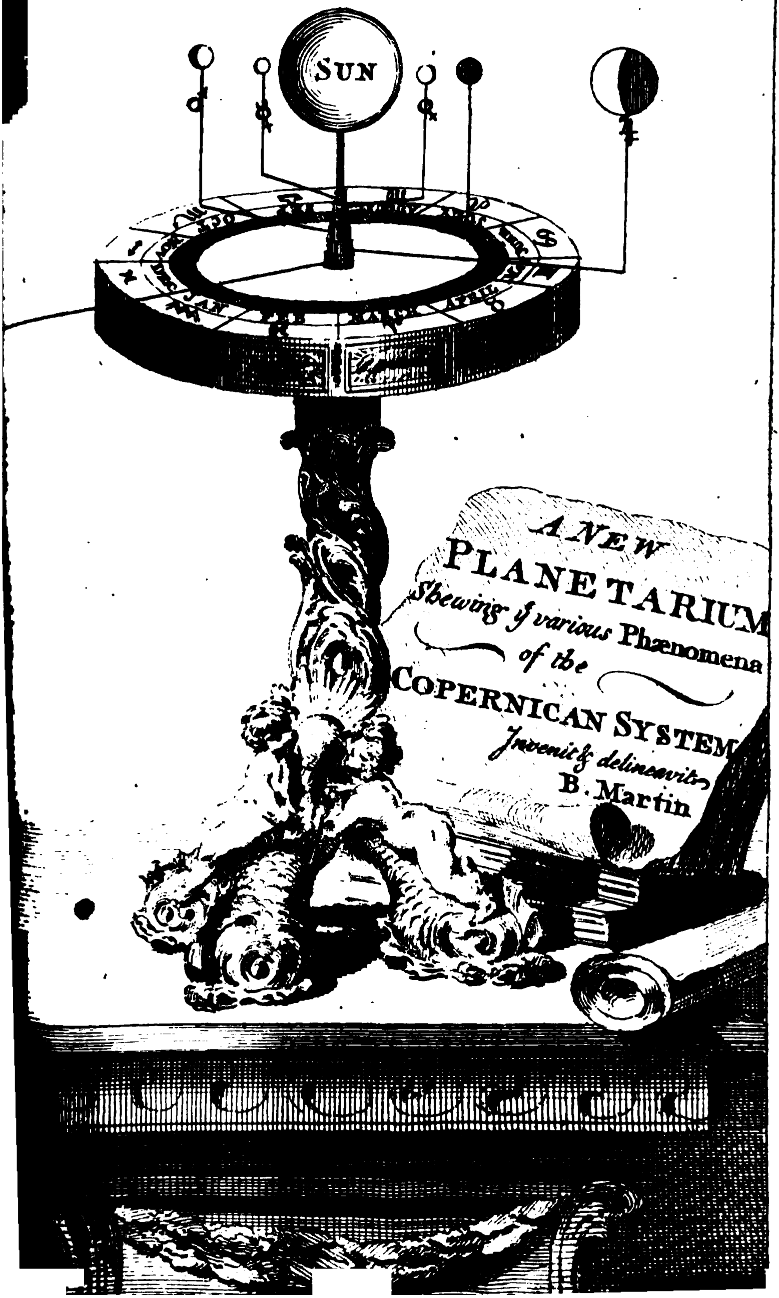
Cleon. What you obſerve, my *Euphroſyne*, is very juſt; we learn by ſuch Reflections one uſeful Leſſon, that Things are great and ſmall only by Compariſon; In regard to many other Properties of Bodies, you will find that this Doctrine will alſo hold good, as we proceed in our Speculations.

Euphroſ. I ſuppoſe, the Diſtances of the Planets repreſented in the Print, are in Proportion to thoſe in the Heavens, are they not, *Cleonicus?*

Cleon. They are ſo, as nearly as thoſe Diſtances are at preſent known; but in the Year 1761, when *Venus* will appear on the Sun's Face, the Diſtances of the Sun and Planets will be very accurately determined, and not till then. We ſhall therefore conclude with a View of this Syſtem in Sir *Richard*'s poetical Deſcription.

This wide Machine the Univerſe regard,
With how much Skill is each Apartment rear'd;
The SUN, *a Globe of Fire, a glowing Maſs,*
Hotter than melting Flint, or fluid Glaſs;
Of this our Syſtem holds the middle Place.
MERCURIUS *neareſt to the central Sun*
Does in an oval Orbit circling run;
But rarely is the Object of our Sight:
In ſolar Glory ſunk, and more prevailing Light.
VENUS *the next, whoſe lovely Beams adorn,*
As well the dewy Eve as opening Morn,
Does her fair Orb in beauteous Order run.
The GLOBE TERRESTRIAL *next, with ſlanting Poles,*
And all its pond'rous Load unwearied rolls.
Then we behold bright planetary JOVE,
Sublime in Air thro' his wide Province move.
Four Second Planets *his Dominion own,*
And round him turn as round the Earth the Moon.
SATURN *revolving in the higheſt Sphere*
With ling'ring Labour finiſhes his Year.

Plate IV.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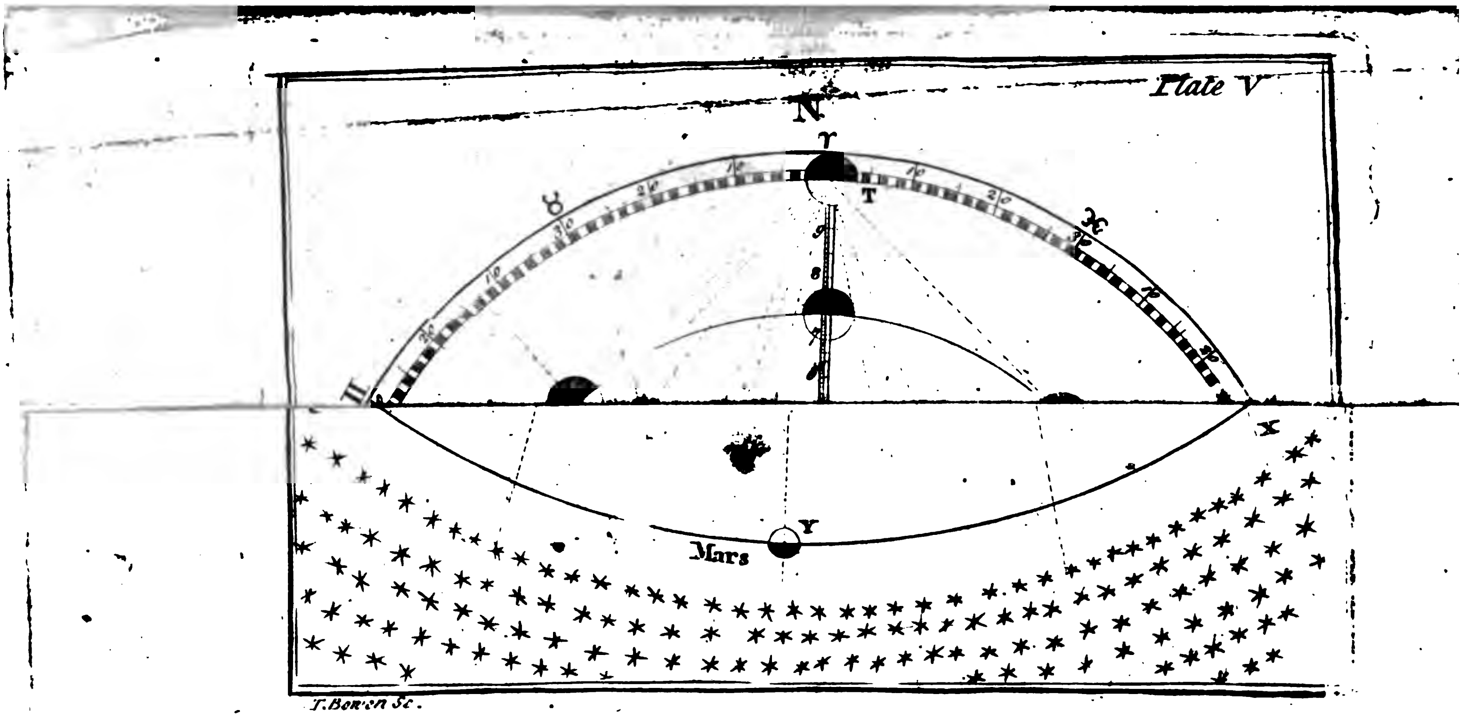
of the
COPERNICAN SYSTEM
Invenit & delineavit
B. Martin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DIALOGUE VI.

The Truth of the Solar Syſtem demonſtrated by the Planetarium.

Cleonicus.

BY this deſcriptive View of the Solar Syſtem, I preſume, my *Euphroſyne*, you will be prepared to underſtand a Demonſtration of the Truth of it, by comparing the ſeveral Appearances of the heavenly Bodies with thoſe of this Syſtem, as repreſented by the *Planetarium.*

Euphroſ. I make no Doubt, dear *Cleonicus*, but I ſhall, as you have a happy Method of repreſenting Things ſo natural and eaſy; eſpecially as I apprehend the Subject now is but juſt the Reverſe of what you ſhewed me before, when you refuted the *Ptolomaic Syſtem*, by the ſame Machine.

Cleon. It is true, my *Euphroſyne*, Truth is but the Reverſe of Error, at any Time, and to be convinced of the latter is more than half the Way towards a Diſcovery of the former. In order to this you obſerve, there is ſome Alteration made in the Face of the *Planetarium.*

Euphroſ. I do, *Cleonicus*, I ſee you have taken the Earth from the Center, and placed a large golden Ball in its Stead; alſo I obſerve, you have taken away the ſmall Braſs Ball from among the Planets (which before repreſented the Sun) and placed, in its Room, a little Ivory Ball, with Circles, to repreſent our Earth, I ſuppoſe, as no more than a *Planet*; theſe are bold Innovations, *Cleonicus*, in a Syſtem of Worlds; but I know you are able to anſwer for them, when there is Occaſion.

Cleon. Yes; while we are able to give a good Reaſon for what we do, we are always ſecure and courageous; 'tis a prodigious Advantage to have *Nature* and *Truth* both on our Side; one ſupplies us with all the Powers of *Logic* and *Rhetoric*, and the other renders us always victorious and triumphant. This has been, and ever will be the Caſe of the *Solar-Syſtem*, and all other Parts of the *Newtonian Philoſophy*, ſince they have been conſidered and treated in a proper Manner.

Euphroſ. Well, *Cleonicus*, I find you are a Champion in the Cauſe of Philoſophy; but put the Machine, if you pleaſe, into Motion, and let us proceed to Particulars; for I long to be inſtructed in this moſt beautiful Part of the Science.

Cleon. I will.——I wind up the Spring, and——you ſee all the Planets in Motion, at the different Diſtances, and Degrees of Velocity.

Euphroſ. I do, *Cleonicus*, with Abundance of Pleaſure; and I ſuppoſe, by this Means, I have now a proper Idea of the true Syſtem of the World; or is there any Thing yet wanting?

Cleon. Yes, my *Euphroſyne*, too much is yet wanting to compleat a perfect Idea of the Syſtem, at leaſt, in one View—Nor is it in the Power of Art to ſupply every Thing. The proportionable Diſtances of the Planets, together with the true Proportion of their Magnitudes, can never be ſhewn in any Machine, but ſeparately they may; as you have already obſerved in the Plate of the Solar Syſtem. And I ſhall only here obſerve, that if the Magnitudes are the ſame as there repreſented, the Diſtance of the Earth from the Sun would be 83 Feet, and that of *Saturn* nearly 800, ſo that the Orbit of *Saturn* would be almoſt a *Mile* in Circumference, and conſequently no *Planetarium* can ever be made to expreſs the Proportion of Diſtances and Magnitudes at the ſame Time.

Euphroſ. I am convinced it cannot be done, *Cleonicus*, by what you have ſaid; and one Thing I obſerve farther, and that is, it would be but of little Uſe if it could be made ſo large; ſince then we muſt be at the Trouble of walking from one Part to another to view the ſeveral Bodies of the Syſtem; for it is eaſy to ſee, that *Mercury*, *Venus*, the *Earth*, and *Mars*, would be all of them by much too ſmall to be ſeen at the Diſtance of *Saturn*, (and indeed the three firſt at *Jupiter*) without a Teleſcope. I proteſt, *Cleonicus*, I can ſcarce reflect on ſuch diminutive Conſiderations of the Earth, without feeling ſome Uneaſineſs; I am quite concerned, when I think what a mean, and almoſt pitiful Figure we make in the Syſtem. However, there is one Comfort; we are not the leaſt of all the Planets.

Cleon. No, no, Siſter, don't be diſcouraged; our Earth is a Planet of the *third Magnitude*, if that will afford you any Conſolation. — But let us attend to the Machine; you [illegible] obſerve one Thing right, *viz.* the Velocity of the Motion of the Planets, and conſequently, the Planets here finiſh their Periods ſooner or later, juſt as they do in the Heavens. And not only this, but every other *Phænomenon* is the ſame here as you obſerve it in Nature, as will be evident by conſidering them ſeverally, as we did when the *Ptolomaic Syſtem* was repreſented, and confuted by it.

Euphroſ. This I ſhall attend to with great Pleaſure; for it is ſtill a ſuperior Satisfaction to ſee what Truth is, and the Ways and Means by which it is infallibly diſcovered; as our little mundane Syſtem, therefore, is all in Motion, pray, *Cleonicus*, proceed to Particulars.

Cleon. I will, my *Euphroſyne*, and begin with the *Phænomena* of *Mercury* and *Venus*, as before; only here you are ſuppoſed to be a Spectator of theſe Motions, from that ſmall Globe with Circles that repreſents the Earth; and from thence you ſee thoſe two Planets in one Part of their Orbits paſs before the Sun, and, in the other Part, behind, or beyond it; and this is their conſtant Appearance in the Heavens.*

Euphroſ. I ſee it muſt neceſſarily be ſo; and it is ſurprizing to me, that ſo very plain a Caſe was not alone ſufficient to convince Mankind in every Age of the Truth of this Syſtem.

Cleon. The longer you live, the leſs you will be ſurprized at ſuch Things; you will find Ignorance, Prejudice, Party or Policy, always eclipſing the Truth, as Clouds do the Sun, tho' both are in themſelves the brighteſt Objects in Nature. You will find, the next Phænomenon you obſerve is equally coercive, if Men would reflect or attend to it at all, *viz.* that *Mercury* and *Venus*, can never appear to us at any great Diſtance from the Sun; *Mercury* not above 21 Degrees, and *Venus* not more

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* The Reader is here ſuppoſed to have his Eye upon the Diagram in Plate V. where all the Phænomena, mentioned in this Dialogue, are repreſented juſt as they are ſeen in the *Planetarium*. Thus, Phænomenon I. to an Eye placed on the Earth at T, the Planet *Mercury* at M, and *Venus* at V, will appear to paſs before the Sun; and at O and D they are beyond, or behind the Sun, if viewed from the ſame Place.

than 47; and this correſponds exactly with the Diſtances from the Sun in the Heavens when greateſt of all.†

Euphroſ. I have hardly Geometry enough to underſtand Meaſuring Diſtances by Degrees; but, I eaſily ſee the Thing you drive at, and indeed you have already explained it to me in a former Converſation.

Cleon. You will find, my *Euphroſyne*, that a very little Mathematics is requiſite for underſtanding the Phænomena, when we come to explain it ſtill farther by a proper Diagram, exhibiting the Theories of theſe two Planets; and a particular Piece of Machinery added to the Orrery for that Purpoſe: The next Phænomenon will create you no Difficulty; for as you obſerve, the Diſtance of the Earth is perpetually altering, with reſpect to any Planet, I ſuppoſe, you have Philoſophy enough to ſee what will follow from thence.*

Euphroſ. Very plainly, *Cleonicus*; I have, 'tis to be hoped, common Senſe enough to know, that when the Earth is near to any Planet,—that Planet will appear larger than it will do when the Earth is remote from it, and thence I may infer, that the apparent Magnitudes of the Planets are always variable; and ſo, I ſuppoſe, you obſerve them to be in the Heavens; for I remember well what you ſaid of the Planet *Mars*, when we conſidered this Phænomenon in *Ptolomy*'s Syſtem.

Cleon. I am glad to find you can ſo happily recollect, and compare theſe Appearances. We have, from the ſame Principle too, the Solution of another common Phænomenon of the Planets; pray do you remember that alſo?

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† Phænomenon II. If right Lines be drawn from the Earth at T, touching the Orbits of *Mercury* and *Venus*, in the Points R and A, on one Side, and Z and G on the other, 'tis evident thoſe Lines will be farther from the Sun, than Lines drawn to any other Points of thoſe Orbits, and conſequently, the Planets, in thoſe Points, will be ſeen farther from the Sun than in any other; and the Angle S T R will be found about 21 Degrees, and the Angle S T A about 47.

* Phænomenon III. 'Tis evident, that as the Planet *Mercury* moves from M to H N T; and *Venus* from V to A B C, they will appear leſs and leſs; and that their apparent Magnitudes will encreaſe as they move from O to K P I, and from D to E F G towards the Earth at T, alſo ſince the Earth at T is about 5 Times farther from *Mars* at Y, than it is when at T, the ſaid Planet will appear 25 Times leſs in the Former than in the latter Situation.

Euphroſ. I believe I do; for my Reaſon ſuggeſts to me, that the apparent Motions of Bodies muſt be greater when they are near, than when they are very far off; and moreover, that their viſible Magnitudes and Motions are always greateſt and leaſt at the ſame Time *.

Cleon. Very good, my *Euphroſyne*; there is ſome Pleaſure in teaching Philoſophy to you, who will ſoon be Miſtreſs of many of the moſt uſeful Doctrines of the Science; you already know the Reaſon why the Planets apparent Motions muſt be very unequal; but why they ſhould ſometimes appear ſtationary, or without any Motion for a Time, I do not expect you to apprehend ſo readily as yet; but hereafter you will ſee no Difficulty in that.

Euphroſ. I perceive Science is a gradual Thing, *Cleonicus*; nor do I expect to be wiſe all at once: I ſhall be very well ſatisfied, if with Time, I can acquire ſuch a Competency of Knowledge as is fit for a *Woman*.

Cleon. You ſhould ſay, a *reaſonable Being*, my *Euphroſyne*; uſeful Science is of neither *Sex*, or any Party.———But to return.———While the Planets are in Motion, you obſerve, from the Earth they will be ſeen to move in *different Directions*; for Inſtance, *Mercury* you ſee is now on the *Left-Hand* ſide, or *Eaſt*, of the Sun; but from thence he moves on this Side of the Sun to the Weſt;———from that Weſtern Situation on the Right-Hand, he moves on behind the Sun to the Eaſt Side, where he was before; ſo that in one Revolution, he is ſeen to move from *Eaſt* to *Weſt*, and from *Weſt* to *Eaſt* †.

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* Phænomenon IV. In the Points of the Orbits where the Planets are neareſt, as at V and M, they will appear to move faſteſt; and *vice verſâ*, at the remoteſt Points O and D; alſo the Velocity of the Planet *Mars* at Y, will appear = 5 Times greater to the Earth at *t*, than it will do when the Earth is at T, at 5 Times the Diſtance as before.

† Phænomenon V. It is eaſy to obſerve in the Scheme, that to an Eye placed at T, the Planet *Mercury*, as it paſſes from R, by O, to Z, will appear to move forwards, according to the Order of the Signs, or from Weſt to Eaſt; but from Z, by M to R, it will appear to move the contrary Way, *viz.* from Eaſt to Weſt, or be retrograde. And a little Way on each Side the Points R and Z, *viz.* from A to B, and from C to D, the Planet muſt appear ſtationary, or at Reſt among

Euphroſ. I ſee it clearly, *Cleonicus*, and I remember alſo, you obſerved to me (in the other Syſtem) that this is the Caſe of all the Planets; and I expect I ſhall be able to ſee it verified by my own actual Obſervations on the Planet *Venus*, in a little Time, after the Manner you then directed me.

Cleon. You will then commence a *Practical Aſtronomer*, Siſter; and indeed by a little Attention and Practice, you will find it not only eaſy, but pleaſant to obſerve all the Phænomena of the Heavenly Bodies to be the very ſame as you have ſeen in this *Planetarium*; and then you will be fully convinced of the Truth of this Syſtem.

Euphroſ. I ſhall, nay, I am ſo already, *Cleonicus*; for I think it is impoſſible any one, who has ſeen all thoſe Things ſo naturally, and, as it were, doubly repreſented, as I have, ſhould not be convinced, at leaſt, that the Earth is a Planet, and the Third from the Sun;———But pray, *Cleonicus*, may not theſe Appearances happen to a Spectator on the Earth at Reſt among the Planets, as well as on the Suppoſition of its Motion; if ſo, there will ſtill lie an Objection againſt the Earth's Motion.

Cleon. 'Tis with great Pleaſure I hear you make this Queſtion, as you thereby diſcover almoſt a critical Sagacity in theſe Matters in ſo ſhort a Time. I anſwer, my *Euphroſyne*, the Phænomena, 'tis true, would be the ſame to the Earth at Reſt, as we have now ſpecified them; but you muſt know withal, that they would not, in that Caſe, happen at the ſame Times they now do, nor in the ſame Parts of the Heavens.

Euphroſ. I am very deſirous of ſeeing this illuſtrated, *Cleonicus*: Can you ſhew it in the *Planetarium?*

Cleon. Very eaſily; for I'll fix the Earth at Reſt in the Beginning of the Ecliptic, or firſt Point of *Aries* (as it is no Matter where) and bring the Planet *Mercury* in a right Line with the Earth and Sun; it is then in Conjunction with the Sun; then, putting the Machine in Motion, you obſerve that Planet, in 88 Days, comes to the ſame Place again, and therefore, if the Earth were at Reſt, the Time between two Conjunctions of the ſame Kind, would be juſt equal to the Period of the Planet's Revolution,

among the Stars at Q and X, ſince thoſe ſmall Parts of the Orbit do nearly coincide with the Tangent Line. But this Matter will be farther explained in a future Dialogue.

Revolution, and always in the ſame Point of the Ecliptic: Do you underſtand me?*

Euphroſ. I muſt be very dull indeed, if I did not perfectly well———

Cleon. Then ——— I put the Earth, as uſual, in Motion; ſetting out with the Planet; ——— but you ſee, when *Mercury* returns to the ſame Point again, the Earth is gone, and the Planet keeps moving on 'till it overtakes the Earth.—Here you obſerve a Time conſiderably longer than the Period is taken up between the two Conjunctions, *viz.* more than 110 Days.

Euphroſ. I ſee wonderfully plain, and alſo I obſerve the Earth has paſſed over about a third Part of its Orbit in the Time; and conſequently, I muſt needs know, that both the Time and Place of the preſent Conjunction are very different from the former; and therefore am neceſſarily convinced of the Motion of the Earth, as well as of all the reſt of the Planets about the Sun. I ſee the Truth, and much of the Beauty and Harmony of the Solar Syſtem; for which I ſhall be ever infinitely indebted to my dear *Cleonicus.*

Cleon. They who contemplate Nature, my *Euphroſyne*, always find their Admiration and Pleaſure encreaſing with their Knowledge; the more nearly we view her, the more engaging ſhe appears; and what you have yet ſeen is but, as it were, an *Antepaſt* of the ſublime Conſolations of Philoſophy, that will moſt certainly reward your future Enquiries, as you will acknowledge, when you come to underſtand the Doctrine of *Eclipſes*, and to be able to calculate one.

Euphroſ. To calculate an Eclipſe! A ſtrange Thing to talk of for a *Woman*, *Cleonicus.*

Cleon. A Woman!——Why, this *Woman-hood* of yours, ſeems to be mightily in the Way. ——— I muſt tell you once more, my *Euphroſyne*, that it is at preſent quite out of the Queſtion; for if indulgent Heaven has favoured you with ſuch mental Faculties and Powers as will enable you to underſtand theſe Things, then why may you not with as good a Grace, and to as great an Advantage, addreſs yourſelf to ſuch an Undertaking? I know ſome Ladies, and doubt not but there are many others, who can calculate both a Solar and Lunar Eclipſe, and intend my *Euphroſyne* ſhall not be behind-hand with any of them. Nay, farther, I have a Sort of eaſy *Philoſophical Geometry* too, nicely adapted to the Genius of the *Fair Sex*, which will let you into the *Rationale*, or Reaſon of every Step you take in ſuch a Proceſs.

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* Phænomenon VI. In the Diagram, it is evident, if the Planet *Mercury* be in Conjunction at M, and the Earth at Reſt at T, it will be in Conjunction again, after one Revolution, in the ſame Point M, *viz.* in 88 Days. But ſuppoſing the Earth and Planet go on together from the Points T and M, the Planet will have made one Revolution, and Part of another, before it can get between the Earth and Sun; it will then be nearly in the Point ☿ and the Earth will be in ⊖, about four Signs diſtant from T, the Place of the former Conjunction.

Euphroſ. You have ſaid enough, *Cleonicus*; if you enlarge much farther, you will ſurely make an *Angel* of me.

Cleon. There is no Need of that, in the Judgment of ſome People that you know in the World.

Euphroſ. Prithee hold thy Tongue, *Cleonicus*;—and tell me what is in the Inſide of this Machine of yours: Is there any Thing that I can underſtand by what Means you make Art and Nature ſo wonderfully agree?

Cleon. Yes, ſurely, and nothing ſhall be denied to the Curioſity of my *Euphroſyne*; I will take off the Top of the Machine,—and there you obſerve ſeveral Parcels of Wheel-work, great, and ſmall.—Of the firſt, you ſee ſix Wheels all fixed on one Arbor.—

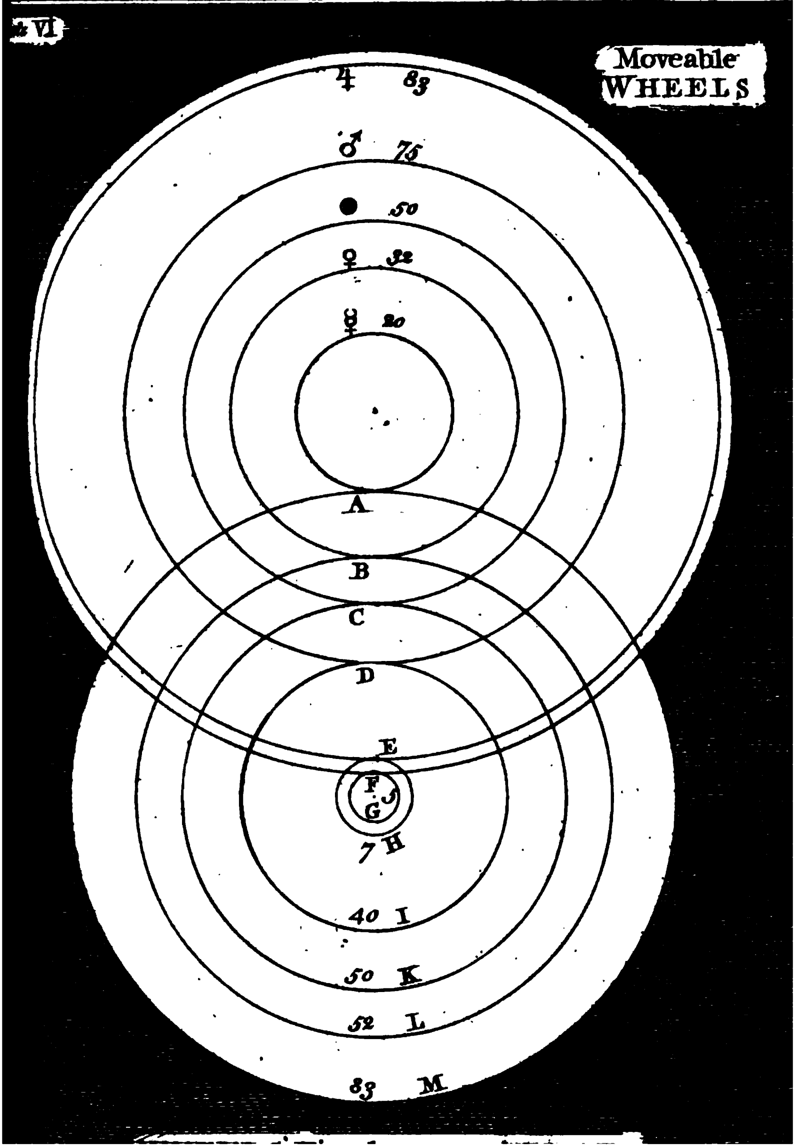
Euphroſ. I do, *Cleonicus*, and as they differ in Size, ſo I obſerve they do in Number of Teeth, which I ſuppoſe are ſhewn by the Figures ſtamped on each Wheel.

Cleon. You are right, Siſter, and you farther obſerve, the Teeth of theſe fixed Wheels play in the Teeth of ſix other moveable Wheels, all placed about one common Axle.—In each of theſe Wheels, there is fixed a long Pipe, or Socket, on the Top of which each Planet was fixed, as you ſaw on the Out-ſide of the Machine.—

Euphroſ. You need ſay no more, *Cleonicus*, for I obſerve now how the Planets are made to move in general; for when the Set of fixed Wheels are put into Motion, the other Wheels are ſeverally moved round in different Times, I ſee, by the different Number of Teeth in each.—

Cleon. Very well, my *Euphroſyne*, and in each Set you obſerve the *third Wheel* from the Bottom is the ſame, and has the

A View of the WHEEL WORK *of the* PLANETARIUM



ſame Number of Teeth, conſequently they go both once round in the ſame Time; therefore may repreſent our *Year*; for you ſee the Ball which repreſents our Earth is carried round on the Socket of that Wheel.

Euphroſ. All this I ſee very plainly; and how then, *Cleonicus?*

Cleon. Then by the Proportion of the other Wheels, the other Planets are made to revolve in their proper Periods of Time. Thus, the firſt Wheel of 83 Teeth drives the firſt of the other Set of 20; therefore *Mercury*, on its Socket, muſt move a little more than four Times round, while the Earth moves once round; for the Number of Teeth in the two Wheels will always be as the Number of Days in the Earth and Planets Revolutions, that is, 83 is to 20, as 365 to 88 nearly; and therefore in 88 Days, the Planet will make one Revolution about the Sun. I hope you underſtand me, Siſter?

Euphroſ. I do very well, *Cleonicus*; and for the ſame Reaſon, I ſee the Period of *Venus* is to the Length of our Year, as 32 to 52; in *Mars*, as 75 to 40; in *Jupiter*, as 83 to 7; and in *Saturn*, as 148 to 5. I ſee the Reaſon of this Affair with much more Eaſe than I imagined I ſhould.

Cleon. Every Thing, my *Euphroſyne*, will be tolerably eaſy, when it is well repreſented, and rightly conſidered; the Rationale of Things is not ſo very myſterious in ſuch Caſes, as is generally thought.—— In the Barrel, you ſee there is a Spring, which by Means of the Fuſee, and its Wheels, puts the Work into Motion; as in a common *Watch*, or *Spring-Clock*, and the Motion made equable by a Regulator: So much at preſent for the Mechaniſm of the *Planetarium*. We ſhall entertain ourſelves with a more immediate View of the great Bodies of the Syſtem, as we have Opportunity; and the next fair Evening, I will ſhew you the Face of the Sun thro' a *Teleſcope*, when he is near ſetting, for then we have the moſt advantageous View of that glorious Lamp of Day.*

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* The Reader will obſerve in Plate VI. that the

Moveable Wheel.		*Fixed Wheel.*
A ☿ of 20 Teeth	is	A M of 83 Teeth.
B ♀ of 32	driven	B I of 52
C ⊖ of 50	by	C K of 50

D♂

Moveable Wheel.		*Fixed Wheel.*
D ♂ of 75 Teeth	is driven by	D I of 40 Teeth.
E ♃ of 83		E H of 7
F ♄ of 148		F G of 5

Hence, if the Time of one Revolution of the Wheel C ⊖, which carries the Earth, be divided into $365\frac{1}{4}$ equal Parts, or Days; therefore, ſince all the fixed Wheels make one Revolution in the ſame Time, it follows,

That $83 : 20 :: 365\frac{1}{4} : 87\frac{1}{4} =$ ☿'s Period.
$52 : 32 :: 365\frac{1}{4} : 224\frac{2}{3} =$ ♀'s Period.
$40 : 75 :: 365\frac{1}{4} : 687 =$ ♂'s Period.
$7 : 83 :: 365\frac{1}{4} : 4332\frac{1}{2} =$ ♃'s Period.
$5 : 148 :: 365\frac{1}{4} : 10759\frac{1}{4} =$ ♄'s Period.

From whence it appears how very accurately the *Annual Motions* of the Planets are determined by this Machinery.

DIALOGUE VII.

Of the SUN.

Cleonicus.

COME forth, my *Euphroſyne*, and let us walk to yonder little Hill, on the Summit of which, we ſhall have a delightful and inoffenſive Proſpect of the milder Sun in his Decline; and the Sky being ſerene, and free from Clouds, we ſhall ſee him gradually make his Exit out of our Hemiſphere to that below.

Euphroſ. That to me will be a grateful Sight, my *Cleonicus*; and I remember, in our laſt Converſation, you propoſed to contemplate the Nature of the Sun more immediately, when we ſhould next walk together.

Cleon. Yes, I did ſo; and, as if apprized of our Deſign, he ſeems to offer himſelf for the Subject of our Speculation this fair Evening. His Face looks of an inviting Aſpect, large, red, and gently glowing; which reminds me of the Poet's Deſcription:

> *The Diſk of* Phœbus, *when he climbs on high,*
> *Appears at firſt but as a blood-ſhot Eye,*
> *And when his Chariot downwards drives to Bed,*
> *His Ball is with the ſame Suffuſion red;*
> *But mounted high on his meridian Race,*
> *All bright he ſhines, and with a better Face.* Dryden's Ovid.

Euphroſ. Well, the Sun, to be ſure, is a noble Subject of Poetry, as well as Philoſophy! But, pray, *Cleonicus*, can you tell me any Thing of the Original of the Sun, and of what his wonderous Body is compoſed?

Cleon. Very little can be ſaid on that Head; *Moſes*, you know, informs us, that God, at the Creation, firſt called for *Light*, and then he made the *Sun*; and 'tis generally ſuppoſed, he made the huge Body of the Sun a Kind of Receptacle, or Reſervoir of Light, from whence it might be diſperſed thro' all Parts of the Syſtem; and thus the famous *Milton* has paraphraſed it in theſe excellent Lines:

Then of celeſtial Bodies firſt the Sun,
A mighty Sphere, he framed; unlightſome firſt,
Tho' of etherial Mould: He form'd the Moon
Globoſe, and every Magnitude of Stars.
Of Light by far the greater Part he took
Tranſplanted from her clouded Shrine, and plac'd
In the Sun's Orb, made porous to receive,
And drink the liquid Light; firm to retain
Her gather'd Beams: Great Palace now of Light;
Hither, as to their Fountain, other Stars
Repairing in their golden Urns draw Light;
And hence the Morning Planet gilds her Horns.
Paradiſe loſt.

Euphroſ. And does not the Light, thus collected, make the Sun's Body a Globe of Fire?

Cleon. Undoubtedly; and the moſt intenſe and ardent Heat poſſible muſt be there conceived.

Euphroſ. I imagine ſo; for I have ſeen a Book in my Papa's Library, which was wrote to prove, that the Sun was the horrible Place which we call *Hell.*

Cleon. 'Tis certain, the Sun is both large enough, and hot enough; and if it be not there, 'tis hard to ſay where it ſhould be. 'Tis certain, however, if *Milton* be right, the Devil is no Stranger in the Sun; for in his vagabond Flight thro' our Syſtem, he makes him light on the Sun, and compares him to a Spot in his Surface.

—— There lands the Fiend, a Spot like which perhaps
Aſtronomer in the Sun's lucid Orb,
Thro' his glaz'd optic Tube, yet never ſaw.

Euphroſ. This is a Fancy in the Poet pretty enough; and now you talk of Spots in the Sun, pray what, and how many are they? Have you ever ſeen them, *Cleonicus?*

Cleon. Yes, my *Euphroſyne*, very often; and they make a very odd Figure in the Sun's Face; their Number is very uncertain, being ſometimes more, ſometimes fewer, and ſometimes you will ſee none at all.

Euphroſ. How big do they appear?

Cleon. Some are large, and ſome ſmall; it has been obſerved, that ſome have been above 100dth Part as wide as the Sun's Face.

Euphroſ. How do they appear ſituated there?

Cleon. Sometimes many together in one Part, in another Part you ſee them ſingle; but they are hardly ever ſeen twice in the ſame Form, Magnitude, or Situation.

Euphroſ. Why then they are continually in Motion, I find; pray, is that Motion any Thing regular?

Cleon. Yes, extremely ſo at all Times; they move, all of them, from the *Eaſtern* to the *Weſtern* Limb of the Sun, and that in the Space of 13 Days nearly.

Euphroſ. When, and by whom were they firſt diſcovered?

Cleon. By the famous *Italian* Philoſopher *Galileo*, in the Year 1610.

Euphroſ. What do Philoſophers ſay they are?

Cleon. Why, I can aſſure you, dear Siſter, the *Indian* Kings, when here, were not more puzzled to account for the Nature, Appearance, and Diſappearance of the Beauty-ſpots on the Faces of the *Engliſh* Ladies, than the Aſtronomers are to account for thoſe of the Sun. Some think, they are not in the Body of the Sun, but are ſome dark Bodies, like Clouds, floating in an Atmoſphere about the Sun; and which, when before him, ſeem like Spots in his Surface. But others more probably ſuppoſe, they are really in the Sun, and occaſioned by an Eruption of Smoke, and other opacous Matter, in various Parts of his Surface; this, as it gradually ſpends itſelf, makes the Spots degenerate into others which look cloudy or miſty; and in the laſt

Place, the ſaid *Calx*, or dark Matter, being quite diſſipated, an Eruption of horrid * Flames ſucceeds, as in a *Volcano*, which make the bright and flaming Parts, that ſome have obſerved to come in Place of the Spots. This is the beſt Account, my *Euphroſyne*, that I can give of the *Solar Spots*.

Euphroſ. I thank you, Brother; but it would be a greater Gratification to have a Sight of theſe Spots; could you no how ſhew them to me?

Cleon. Yes, very eaſily; and 'tis what I intended, when we came out; for which Purpoſe, you ſee, I have brought with me this ſmall Teleſcope, in which I have put a ſmoaked Glaſs next the Eye, that the exceſſive Brightneſs of the Sun might not hurt it in viewing him.

Euphroſ. Dear Brother, I ſee you are very careful to oblige me in every Thing; but the Sun is almoſt down, if you be not ſpeedy, we ſhall loſe Sight of him.

Cleon. There is juſt Time enough; you will now ſee him alſo gradually deſcend the Horizon. Let the Tube be laid upon the upper Bar of this Gate, it will juſt fit your Eye.

Euphroſ. It does ſo indeed.———

Cleon. The Teleſcope is now right to the Sun; put your Eye to the End.

Euphroſ. I do.—

Cleon. Can you ſee any Thing?

Euphroſ. Yes, the Orb of the Sun, prodigious large and bright.—I ſee a Cluſter of Spots in the upper Part; I think there is about 11 or 12.—I ſee a very large one on the left Side,—and two more towards the Bottom.—'Tis an extreme Curioſity, indeed, but it makes my Eye ake.—

Cleon. Reſt a little, and then view him as he ſets.—

Euphroſ. I will.—But he ſeems now to touch the Earth.—I'll view him.

Cleon. He is not ſo near the Earth in the Glaſs.———

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* The *Feculæ*, or flaming Parts of the Sun, we have here mentioned, as they have been deſcribed by others, and particularly by Mr. *Derham*; but we muſt confeſs, tho' we have more than 30 Years conſtantly obſerved the Solar Diſk thro' very good Teleſcopes, we never ſaw the Appearance of any ſuch Thing.

Euphroſ. He's yet a Foot above the Earth: ——Now he juſt touches it;—— the two Spots below are juſt hid; ——the large Spot in the middle touches; —— is gone; —— the Cluſter begins to dip; ——they are all down;—— the Sun is almoſt gone; —— there, he is quite down. ———Well, of all things I ever yet ſaw, this is the moſt delightful and raviſhing Sight! How prodigious large he appears thro' the Glaſs! Pray, can you tell how big he really is?

Cleon. Not certainly; becauſe his Diſtance from the Earth is not certainly known; however, 'tis computed, that the Sun is in Diameter above *Eight Hundred Thouſand Miles*; and if ſo, his Bulk will be a *Million of Times* greater than our Earth.

Euphroſ. Prodigious! I do not wonder you place him in the Center of the Syſtem; it would be a monſtrous Piece of Contrivance, to make a Body ſo immenſely great as the Sun, move about the Earth, which in regard of him is ſo very ſmall.

Cleon. You conceive very well of the Matter, Siſter; ſuch Conduct, in forming a World, can never be ſuppoſed in the all-wiſe Creator, as would be unſufferable in a common Mechanic. But that the Sun is in the Center of our Syſtem you have already ſeen ſufficient Proof.

Euphroſ. And has the Sun, then, no Motion at all?

Cleon. If the Spots are only Blemiſhes in the Sun's Face, and are fixed there as Patches on a Lady's Face, 'tis certain, the Sun has a Motion about its own Center, or Axis; and that in about 25 Days 15 Hours. And this is now no longer an Uncertainty, but proved by the conſtant Uniformity of their Motion.

Euphroſ. But tho' the Sun may move upon it's Axis, yet I ſuppoſe it to be at Reſt in the Center of the Syſtem, I mean, ſo as not to move out of it's Place, is it not, *Cleonicus?*

Cleon. No, Siſter, not perfectly at Reſt there neither. For you muſt underſtand, there is a certain Point, which is the *true*, or *common Center* of all the Planetary Motions, and this Point is at moſt not quite a Diameter of the Sun diſtant from it's Center; about this Point, therefore, the Sun, as well as all the Planets, move; but in what Time is uncertain.

Euphroſ. Well, this Evening has been happily ſpent! And now upon our Return Home, let me know what Kind of poetical Philoſophers we have; for I make no doubt but the Muſes ſing very harmoniouſly on ſuch a glorious Subject.

Cleon. Oh, very finely indeed; the great Works and Scenes of Nature, you'll find, are the moſt agreeable Themes of the Muſes; they never ſing ſweeter than when they chant the Wiſdom and Magnificence of creating Power. Thus the Rev. Mr. *Brown*:

In the Beginning, the Almighty ſaid,
Let there be Light; *that Inſtant Darkneſs fled;*
All radiant Day her roſy Beams diſplay'd,
And the young World in ſplendid Dreſs array'd.
The blazing Sun, upriſing from the Eaſt,
Like a young Bridegroom in his Glories dreſs'd,
His ſpiral Courſe thro' Voids immenſe begun,
Ages to roll, and ſwift as Time to run,
Surveying, and ſurvey'd, throughout the Vaſt
Of the Creator's Works from firſt to laſt.
Or if, as more ſagacious Sages ſay,
He ſtands faſt fix'd amidſt a Flood of Day,
Around his Orb harmonious Planets race,
By his Attraction mov'd, thro' boundleſs Space.
——— *Hail ſacred Source of inexhauſted Light!*
Prodigious Inſtance of creating Might!
His Diſtance Man's Imagination foils;
His Numbers ſcarce avail to count the Miles.
His globous Body how immenſely great!
How fierce his Burnings! How intenſe his Heat!
As ſwift as Thought he darts his Radiance round,
To diſtant Worlds his Syſtem's utmoſt Bound.
Of all the Planets the directing Soul,
That hightens, and invigorates the Whole.

And Mr. *Baker*, in his *Univerſe*:

Along the Skies the Sun *obliquely rolls,*
Forſakes by Turns, and viſits both the Poles.
Diff'rent his Track, but conſtant his Career,
Divides the Times, and meaſures out the Year.

To Climes returns, where freezing Winter reigns,
Unbinds the Glebe, and fructifies the Plains.
The crackling Ice diſſolves; the Rivers flow:
Vines crown the Mountain-Tops, and Corn the Vales below.

Of his *genial Influences* and *Virtue* which he communicates to the Earth.

His Fires the gentle Flame of Life ſuſtain;
Hence Men and Beaſts and the innum'rous Train
Of Vegetables thrive; hence ſpring the Pow'rs
Which breathe *in* Animals, *and* bloom *in* Flow'rs.

Prize-Verſes, N°. IV. On Aſtronomy.

And *Cowley* thus:

The glorious Ruler of the Morning, ſo
But looks on Flowers, and ſtrait they grow;
And when his Beams their Light unfold,
Ripens the dull Earth, and warms it into Gold.

And of his Beams and Luſtre, which enlightens the whole Solar Syſtem, Mr. *Hulſe* thus poetically deſcants.

Around the Sun the Planets Orbs are hurl'd,
That Center, Eye, and Glory of the World.
See from his Orb, array'd in all it's Pride,
A ſpreading Luſtre ſtreams on ev'ry Side,
And in a Moment gilds the mighty Void!
His Orb ſo rich, his Beams ſo ſwift and bright,
Proclaim the God that made him infinite!

Euphroſ. As the glorious Orb of the Sun appears in all Ages the ſame, pray what did the Antients think of it, *Cleonicus?*

Cleon. Think, why they underſtood ſo little of Nature, exerciſed ſo little Reaſon, and were ſo very ſuperſtitious and devout, that, in ſhort, they made a GOD of him, and really worſhipped him as ſuch, under the Titles of *Phœbus*, *Apollo*, &c. as you will find at large in the *Pantheon*. And the Caſe is the ſame at this Day with the barbarous *Indians*, *Chineſe*, and other Nations abroad. Nay, our *Sabbath* is called *Sun-day*, as being the Day appropriated to the Worſhip of the SUN by our idolatrous Anceſtors, the *Saxons*.

Euphroſ. There's no Doubt but they worſhipped him as the *God* of *Day*, *Light*, and *Heat*; but what other Characters did he ſuſtain among them?

Cleon. They eſteemed him alſo the *God* of *Wiſdom* and *Harmony*; they painted *Apollo* with his *Harp*; and from the conſummate Beauty, Order, and Regularity which they obſerved in the Diſpoſition, and Motion of the heavenly Bodies, they aſſigned them all to his Dominion, and thence their Poets are often chanting the *Muſic* of the *Spheres*, as we ſhall hereafter ſee.

Euphroſ. Pray, *Cleonicus*, has the Sun any great Influence on the Weather, by which its Alterations can be foretold?

Cleon. Yes, Siſter, he has Influence enough on the Atmoſphere, and his Heat is the general Cauſe of all Meteors, and Variety of Weather; and, indeed, by viewing his Orb thro' the Body of Air, variouſly modified and altered by Vapours, they who are uſed to it, as *Huſband-men*, *Shepherds*, &c. may become ſo Weather-wiſe, as often to foretel the Changes that will happen in it. And ſo far the Precepts of *Virgil* are pertinent. *Thus*, of the *riſing Sun:*

————— The Sun, who never lies,
Foretels the Change of Weather in the Skies.
For if he riſe, unwilling, to his Race,
Clouds on his Brow, and Spots upon his Face;
Or, if thro' Miſts, he ſhoots his ſullen Beams,
Frugal of Light, in looſe and ſtraggling Streams,
Suſpect a driſling Day, with ſouthern Rain,
Fatal to Fruits, and Flocks, and promis'd Grain.
Or if Aurora, *with half-open'd Eyes,*
And a pale, ſickly Cheek, ſalute the Skies;
How ſhall the Vine, with tender Leaves, defend
Her teeming Cluſters, when the Storms deſcend?
When ridgy Roofs and Tiles can ſcarce avail
To bar the Ruin of the rattling Hail.

Then of the *ſetting Sun.*

But more than all, the ſetting Sun ſurvey,
When down the Steep of Heav'n he drives the Day.

For oft we find him finiſhing his Race,
With various Colours erring on his Face;
If firy red his glowing Globe deſcends,
High Winds, and furious Tempeſt he portends:
But, if his Cheeks are ſwoln with livid blue,
He bodes wet Weather by his wat'ry Hue,
And ſtreak'd with red, a troubled Colour ſhew;
That ſullen Mixture ſhall at once declare
Winds, Rain, and Storms, and elemental War:
What deſp'rate Madman then would venture o'er
The Frith, *or haul his Cables from the Shore?*
But, if with purple Rays he brings the Light,
And a pure Heav'n reſigns to quiet Night,
No riſing Winds, or falling Storms are nigh;
But northern Breezes through the Foreſt fly,
And drive the Rack, and purge the ruffled Sky.
Th' unerring Sun, by certain Signs, declares
What the late Ev'n, or early Morn prepares;
And when the South projects a ſtormy Day;
And when the clearing North will puff the Clouds away.
VIRG. GEOR. I.

Euphroſ. Well, this is very pretty, and, to be ſure, very poetical; and ſuch Obſervations on the Sun are undoubtedly of Uſe; but did not they go a Step farther, and ſuppoſe the Sun could alſo foretel future Events?

Cleon. Yes, my *Euphroſyne*, they did; and that to the utmoſt Superſtition of Aſtrology; and indeed, we find ſo great a Genius as *Virgil*, employing his Muſe on this vain and ludicrous Subject; for thus he proceeds, in the Place laſt mentioned,

The Sun reveals the Secrets of the Sky,
And who dares give the Source of Light the Lye?
The Change of Empires often he declares,
Fierce Tumults, hidden Treaſons, open Wars;
He firſt the Fate of Cæſar *did foretel,*
And pity'd Rome, *when* Rome *in* Cæſar *fell.*
In Iron Clouds conceal'd the public Light,
And impious Mortals fear'd eternal Night.

But it is no Wonder, if we find *Virgil* making Divination the Subject of Poetry; nor is it impoſſible for ſo wiſe a Man to be a little tainted with the prevailing Doctrine of that Age; and eſpecially, if we conſider, that his Father is reported to have been a Servant to one of thoſe *ſooth-ſaying Impoſtors.*

DIALOGUE VIII.

Of the PLANET *MERCURY.*

Cleonicus.

THIS Morning, my *Euphroſyne*, proves according to our Wiſhes; the Heavens are clear, eſpecially towards the auroral Eaſt, and will preſent us with a good Opportunity of viewing that rare Curioſity, the Planet *Mercury*. He is now at his greateſt Diſtance from the Sun, and riſes before him. He now anſwers to his poetical Character, of being the *Herald* of the *Gods*, and the *Meſſenger* of *Apollo*; for now, it ſeems, he does indeed precede his Sovereign, and proclaims to our diſtant Hemiſphere the gladſome Approach of Day.

Euphroſyne. Pray, *Cleonicus*, where is this extraordinary Planet? I never roſe ſo early, with ſo much Pleaſure, as I have done this Morning in Expectation of viewing him.

Cleon. My Chamber-Window commands a Proſpect of all the eaſtern Horizon; let us take a Teleſcope, and from thence view him before the too great Brightneſs of the riſing Sun obſcure him.

Euphroſ. Let us haſten thither;——your Window commands the Earth as well as Heavens; but, pray, to what Part muſt I look to ſee this rare Object?

Cleon. Let me ſee;——Oh, yonder he faintly appears, juſt over the Top of the Elm; you'll ſee him, if you direct your Eye to that Tree.

Euphroſ. I ſee him; pray, take the Teleſcope, and direct it to him.

Cleon. 'Tis done, my *Euphroſyne*; put your Eye to the End of the Tube, and view this *Harbinger* of *Day*.

Euphroſ. I ſee him;—— he appears very ſmall, but round, and ſomewhat globoſe;——I ſee no Spot, or any Thing beſides a clear Circle of Light;——he appears of a reddiſh Complexion in the Glaſs, tho' very pale without it;——I have loſt Sight of him, by moving the Tube.

Cleon. You have ſeen all that can be ſeen in him; and you may ſay now, you have *once* ſeen *Mercury*.

Euphroſ. Dear *Cleonicus*, I am obliged to you for it. I think you ſaid, he was next to the Sun in the Syſtem.

Cleon. He is ſo; and yet he is computed to be no leſs than *Thirty-two Millions of Miles from the Sun.*

Euphroſ. Indeed! And, pray, can you tell me any Thing of the Magnitude of this Planet?

Cleon. Aſtronomers compute the Diameter of this Planet to be *Two Thouſand Four Hundred and Sixty Miles*; and, therefore, his Body will be a little above a 30th Part as big as our Earth.

Euphroſ. I think you obſerved to me, his Nearneſs to the Sun is the Reaſon why he is with ſo much Difficulty, and ſo seldom ſeen by us.

Cleon. I did ſo. He is the neareſt of all the Planets to the Sun; and his Orbit ſo ſmall, with Regard to the Diſtance of the Earth, that when he is in that Part of his Orbit wherein he appears fartheſt from the Sun, that will ſeem but a ſmall Space in the Heavens; and ſo muſt be taken juſt after Sun-ſet, or before Sun-riſing, according as he is Eaſt or Weſt of the Sun.

Euphroſ. I remember you told me, when you ſhewed me the Motions of the Planets in the *Planetarium*, that you could aſſiſt me yet farther by a Scheme, in underſtanding what relates to the Motions and Aſpects of the Planets; have you any ſuch Thing by you, *Cleonicus?*

Cleon. Yes; I have a Diagram of the Orbits of the *Earth*, *Venus* and *Mercury*, with the Sun in the Center—Here it is.

Euphroſ. Very good; I ſee the Earth at T in the Outermoſt, and the Letters N, E, S, W, I ſuppoſe denotes the North, Eaſt, South and Weſt Points of its Orbit; am I right?

Cleon. Yes, my *Euphroſyne*; you will eaſily apprehend the Theory of the two inferior Planets, *Mercury* and *Venus*, from this Draught, I find.

Euphroſ. *Cleonicus*, don't flatter me.—In that inmoſt Circle or Orbit, the Globes I ſee at M, N, O, P, *&c.* I ſuppoſe repreſent *Mercury* in ſo many Points of his Orbit, do they not?

Cleon. Yes, they do; and firſt, when *Mercury* is in the Point M, he appears to the Earth, at T, to be in the ſame Part of the Heavens with the Sun, and ſo is ſaid to be conjoined with the Sun; from whence that Point is called the *inferior Conjunction* of the Planet.

Euphroſ. Since the Planet is then between the Earth and the Sun, does he not appear to go acroſs the Face of the Sun?

Cleon. Sometimes it ſo happens, but very ſeldom; becauſe *Mercury* does not move in the Plane of the Earth's Orbit. When he chances to traverſe the Sun's Face, he appears like a black Spot in the Sun; thus I ſaw him in the Years 1736, and 1743; and he may be ſeen again in the following Years, *viz.* 1756, 1769, 1776, 1782, 1789, in *October*. And in the Years 1753, 1786, 1799, in the Month of *April*, he will tranſit the Sun's Diſk, as the great Dr. *Halley* has certainly predicted.

Euphroſ. It ſeems to me from the Scheme, that this Planet muſt be again in Conjunction with the Sun in the Point O of its Orbit; for they are there both in the ſame Line from the Earth.

Cleon. 'Tis very true, and that is called the *ſuperior Conjunction* of *Mercury*. In that Situation he is never ſeen; for he either goes behind the Sun, and ſo is totally eclipſed; or if not, he is ſo near the Sun, and ſo ſmall, that he is wholly obſcured by the Sun's tranſcendent Light.

Euphroſ. Does not the Difference of his Diſtances in theſe two Conjunctions make a proportional Difference in his apparent Bulk? I think you told me ſo, *Cleonicus*.

Cleon. Yes, I did; for as he is above twice as far from the Earth in the Point O, as when he is in M, ſo he appears almoſt thrice as big in M, as he does in O, as they find, who have obſerved him in theſe Places with good Teleſcopes. The Poſitions of the Planet at N and P, are thoſe in the middle Points between the Conjunctions.

Euphroſ. But how comes it to have that particular Situation at R, in the Scheme?

Cleon. Becauſe that is the Part of the Orbit in which he appears to be at the greateſt Diſtance from the Sun, and which he poſſeſſes at this Time; for a ſtrait Line T R, drawn thro' the Centers of the Earth and Planet, does but juſt touch its Orbit. In this Caſe, he is ſaid to be in his *greateſt Elongation from the Sun.*

Euphroſ. I believe I apprehend you; for a Line joining the Centers of the Earth and Planet in any other Situation H I, would be nearer the Sun. But, which Way does the Planet move in its Orbit?

Cleon. I thought your Memory would have let nothing ſlip; but you will eaſily recollect, that it moves from M to R, and ſo by N to O and P. That is, it moves from the *North* to the *Weſt*, to the *South* and *Eaſt*, if I may be allowed ſo to expreſs it.

Euphroſ. Then I ſee, while *Mercury* paſſes through the Right-hand Half of its Orbit from M by N to O, he will be ſeen on the Weſt Side of the Sun; and while he marches through the other Half O P M, he will appear Eaſtward of the Sun.

Cleon. Very right, my *Euphroſyne*; he will ſo; and therefore from the Time of his inferior to his ſuperior Conjunction, he will *riſe and ſet before the Sun*; but from his ſuperior Conjunction to his inferior, he will *riſe and ſet after the Sun*; in which Caſe, he will be viſible only in the Evening; in the other, (which is the preſent Caſe) he can be ſeen only in the Morning.

Euphroſ. This is all very plain; and I remember you told me in a general Way, that he made his Tour about the Sun in 88 Days; but, pray, what is the preciſe Time of Period?

Cleon. *Mercury* revolves about the Sun in the Space of 87 Days, 23 Hours, and 16 Minutes, wherefore the Year to the *Mercurians* is about one Quarter of our Year.

Euphroſ. Now you talk of the Inhabitants of *Mercury*, pray, if there be any, how is it poſſible they ſhould endure the exceſſive Heat of the Sun there, being ſo near to him?

Cleon. The Heat there muſt be about ſeven Times as hot as our Torrid Zone; but the Bodies of Animals and Vegetables, if any, muſt be tempered accordingly to ſuſtain it. It is an equal Taſk to Omnipotence to make a Claſs of Beings as fit to endure one Degree of Heat or Cold, as another. Mr. *Baker* has ſome fine Lines on this Head.

Firſt MERCURY, *amidſt full Tides of Light,*
Rolls next the SUN, *thro' his ſmall Circle bright.*
All that dwell there muſt be refin'd and pure;
Bodies, like ours, ſuch Ardour can't endure.
Our EARTH *would blaze beneath ſo fierce a Ray,*
And all its Marble Mountains melt away. Univerſe.

Alſo, thus Mr. *Brown* in his Prize-Verſes on Aſtronomy:

In the near Neighbourhood of Phœbus' *Car*
Rolls, ſwiftly circl'ing, the Mercurial *Star;*
Obſcure he moves, immers'd in Floods of Light,
And ſeldom greets the nice Obſerver's Sight:
Then moſt conſpicuous, when th' eclipſing Moon,
With interpoſing Shadow, veils the Sun. N°. IV.

And again in N°. III.

Firſt verging on the lucid Fount of Day,
Bright MERCURY *directs his circling Way;*
In three ſhort Months he rounds the ſolar Sphere;
His Seaſons ſhift, and ends his tranſient Year.

Euphroſ. I ſuppoſe it was from this quick Motion of his, that he obtained the Poſt held among the Gods; at leaſt, I learn this Hint from the *Pantheon*, in which I have been pretty converſant ſince you referred me to it in our laſt Conference about the Sun.

Cleon. Yes, he was, from the Velocity of his Motion, conſidered Mythologically, as the *Meſſenger* of the *Gods*, by the Poets of thoſe fabulous Ages; his Office was denoted by emblematical Wings on his Head and Feet, and his *Caduceus*, or Rod of Authority, entwined by two winged Serpents, which he carried in his Hand; and thus he is deſcribed by *Virgil*, when ſent by *Jupiter* to prepare a kind Reception for *Æneas* among the *Carthaginians*.

Down from the Steep of Heav'n Cyllenius *flies,*
And cleaves with all his Wings the yielding Skies:
Soon on the Lybian *Shore deſcends the God;*
Performs his Meſſage, and diſplays his Rod. ÆNEID I,

Some Time after, he receives a Commiſſion from *Jupiter*, to order *Æneas* to retreat from *Carthage*, in the following Lines:

> *He calls* Cyllenius, *and the God attends;*
> *By whom his menacing Command he ſends.*
> *Go, mount the weſtern Winds, and cleave the Sky,*
> *Then, with a ſwift Deſcent, to* Carthage *fly;*
> *There find the* Trojan *Chief.* ———

His Inſtruction given,

> Hermes *obeys; With golden Pinions binds*
> *His flying Feet, and mounts the weſtern Winds:*
> *And whether o'er the Seas, or Earth he flies,*
> *With rapid Force, they bear him down the Skies.*
> *But firſt, he graſps within his awful Hand,*
> *The Mark of Sov'reign Power, his Magic Wand:*
> *With this, he draws the Ghoſts from hollow Graves,*
> *With this, he drives them down the* Stygian *Waves;*
> *With this, he ſeals in Sleep, the wakeful Sight;*
> *And Eyes, tho' clos'd in Death, reſtores to Light.*
>
> ÆNEID IV.

DIALOGUE IX.

Of the PLANET *VENUS.*

Euphroſyne.

DEAR *Cleonicus*, this Morning you entertained me with an Account of the Planet *Mercury*; and, if you think fit, we will ſpend this Evening in diſcourſing of *Venus*, which you ſaid was next to *Mercury*, in the Syſtem.

Cleon. Nothing will be more agreeable to me, *Euphroſyne*; and it happens very opportunely for us, that *Venus* is now alſo in her greateſt Elongation, or fartheſt Diſtance from the Sun, and therefore will, in this clear Evening, afford us a moſt ſplendid Appearance. It is but ſtepping Without-doors, and looking Weſtward, you'll ſee her Ladyſhip very brillant.

Euphroſ. I believe I do; for I preſume it is that large, bright Star, that appears alone in the Heavens over yonder Hill.

Cleon. Yes, that is ſhe; let us take a Walk to the Hill, and there view her with the Teleſcope on the ſame Gate we viewed the Sun.

Euphroſ. With all my Heart, dear *Cleonicus*; come away; I long to ſee her Face in the Optic-Glaſs.

Cleon. As we go over theſe three or four pleaſant Fields, let us view her Orbit in the little Scheme we uſed in the Morning. ——— Here it is. *

Euphroſ. Very good; I ſee *Venus*'s Orbit; — it is that which lies between *Mercury* and the *Earth.*

Cleon. It is ſo; and for that Reaſon, ſhe has the ſame Appearances, with Reſpect to the Earth, as *Mercury* had, *viz.* ſhe has an *inferior Conjunction* at V, and a *ſuperior One* at D; and while ſhe paſſeth from V by B to D, ſhe is ſeen at the Earth T on the *Weſt Side* of the Sun; and while ſhe goes from D by F to V, ſhe appears on the *Eaſt Side* of the Sun.

Euphroſ. Then alſo, when ſhe is Weſt of the Sun, ſhe riſes and ſets before him; and when Eaſt, ſhe ſets and riſes after him, as you ſaid of *Mercury*; I preſume I am right, *Cleonicus.*

Cleon. Very right, Siſter; and for that Reaſon, ſhe appears, in the firſt Caſe, only in the *Mornings*, and in the latter, only in the *Evenings*; on which Account (becauſe ſhe is bright and appears firſt) ſhe is called the *Morning* and the *Evening Star*, by Way of Preheminence. Accordingly Mr. *Baker* thus deſcribes her:

Fair VENUS *next fulfils her larger Round,*
With ſofter Beams, and milder Glory crown'd;
Friend to Mankind, ſhe glitters from afar,
Now the bright Ev'ning, *now the* Morning Star.

UNIVERSE.

Euphroſ. On the ſame Account, I ſuppoſe, it was, that ſhe had the Name of *Phoſphor* and *Veſper*, among the heathen Poets; for you muſt know, I am now ſo well read in the *Pantheon*, that

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* The Reader is referred to Plate V. Page 25, for every Thing that relates to the Theories of *Mercury* and *Venus* in the laſt, and preſent Dialogue.

that I can quote Chapter and Verſe for almoſt any Thing you find in the Heavens.

Cleon. Thus it was, indeed; for when ſhe was the *Morning Star*, the *Greeks* called her *Phoſphor*, and the *Latins* called her *Lucifer*, both which Names import ſhe uſhered in the *Light*, and *Day*; and when ſhe was the *Evening Star* ſhe was called *Veſper*, and *Heſperus*, by the *Greeks*; which Names alſo ſignify the *Evening*, or *Cloſe of Day*, among thoſe People. Thus Mr. *Brown.*

But ſee! how gentle Veſper, *ſweetly gay,*
Leads the fair Ev'ning with her ſilver Ray,
Now gilds the Night, *now* uſhers in the Day.

Prize Verſes, N°. I.

And again,

See! Venus *next reveals her pleaſing Ray,*
Now leading on, now cloſing up the Day.
Term'd Phoſphor, *when her* Morning Beams *ſhe yields,*
And Heſp'rus, *when her Ray the Ev'ning gilds.*

Prize Verſes, N°. IV.

Euphroſ. Give me the Diagram once more, *Cleonicus*, there is one Thing which does not appear to me very plain yet, and that is this; you often ſay, that the Planets all move from the *Weſt* by the *South* to the *Eaſt*, and from thence by the *North* to the *Weſt* again; but if ſo, as I know they do, and ſaw very plainly in the *Planetarium*, how is it they appear to go backwards in the Heavens? I remember, you told me, I ſhould be better enabled to underſtand this Matter by a proper Diagram.

Cleon. I did, my *Euphroſyne*; and you will find it eaſy to conceive by attending to the Scheme (Plate V.) in the following Manner, *viz.*

Firſt, While *Venus* moves from her greateſt *Weſtern Elongation* A by B, D, and F, to her greateſt *Eaſtern Elongation* at G, the *Apparent Motion* is the ſame Way as the *True*; and then ſhe is ſaid to be *direct* in Motion.

Secondly, But when *Venus* moves from G by V to A, ſhe will appear to an Inhabitant of the Earth at T, to move back again from *Eaſt* to *Weſt*; which is *contrary to her true Motion*, and ſhe is then ſaid to be *Retrograde*.

Thirdly, When ſhe is about the Points G and A, ſhe will not appear to move at all for the Space of a few Days; and then ſhe is ſaid to be *Stationary*. This will more eaſily appear, if you conſider, that the Planet is ſeen by a Ray of Light coming from it to the Spectator's Eye at T, as T A, T B, T C, T D, *&c.* Now the Planet at A makes the Ray T A fall fartheſt of all from the Ray T S, which paſſes thro' the Sun, and thence the Planet, in that Situation, is ſaid to be *moſt of all elongated* from the Sun. As it paſſes from thence to B, the Ray T B comes neareſt to T S, or the Sun; and ſtill nearer, when arrived at C, and quite in Conjunction at D; and after that, the Planet carries the Ray from the Sun on the other Side towards the Eaſt, 'till it arrives to the Situation G; in which Point the Ray T G makes the greateſt Angle of Diſtance on that Side with the Ray T S. After this, as the Planet goes on from G to V, the Ray returns back, and makes the Planet *retrograde* to the Sun; and as it proceeds from V to A, the Ray goes back ſtill, 'till it arrives at its firſt Situation at T A; and then it goes *forwards* as before.

Euphroſ. I underſtand perfectly well what you have ſaid; and the ſame Things I ſee true of the Planet *Mercury*, *viz.* that he is ſeen at the greateſt Diſtance from the Sun on the Weſt by the Ray T R, which ſhews him among the Stars at Q; and on the Eaſt by the Ray T Z, by which he appears in the Heavens at X; and that during his Paſſage from R by O to Z, he is *direct* in Motion; but while he moves from Z by M to R, the Ray goes *back again*, and ſhews the Planet *retrograde* from X by W to Q. I believe I am right, *Cleonicus*, and that I ſhall be a Piece of an Aſtronomer by-and-by.

Cleon. You take Things ſo readily, my *Euphroſyne*, that I make no Doubt of your being an *Adept* in the Science ſoon; however, one Thing you have not obſerved, *viz.* that ſince *Mercury* appears to deſcribe the ſame Space in the Heavens Q X while he deſcribes very unequal Parts of his Orbit R O Z and Z M R, he muſt neceſſarily appear to move much *ſlower*, when he is *direct in Motion*, and ſwifter, when he is *retrograde*; which is ſtill more evidently the Caſe of *Venus*, where the Arches A D G and G V A are much more unequal.——Accordingly Mr. *Brown*——

She forward *moves, now pauſing,* fix'd *appears,*
Or wand'ring retrograde *among the Spheres.*
Prize Verſes, N°. IV.

But we are now arrived at the pleaſant Eminence which commands in ſo fine a Manner, the Weſtern Horizon. See the illuſtrious Star! how bright ſhe ſhines in Defiance of the Twilight, which veils, as yet, the more diſtant Stars from Sight.

Euphroſ. I ſee her, exceeding bright indeed! and, if I miſtake not, ſhe caſts a ſenſible Shadow.

Cleon. She does, indeed; the Poet might well term her the leſſer Moon.

Next Venus, *matchleſs for her brillant Light,*
Seems as the leſſer Cynthia *of the Night.*

Yea, ſo large and bright was this Planet ſome Years ago, that almoſt half the Nation took her for a *Comet.*

Euphroſ. They could not chuſe but be notable Aſtronomers that made ſuch a Miſtake.——— But, tell me, *Cleonicus,* is not this the Star that hath ſometimes appeared in the Day-time while the Sun has ſhone?

Cleon. The very ſame; I do aſſure you, my *Euphroſyne,* I have ſeen her look forth with a ſerene Brightneſs through the Refulgence of Solar Light.

No Stars beſides their Radiance can diſplay
In Phœbus' *Preſence, the dread Lord of Day;*
Ev'n. Cynthia'*s Self, tho' Regent of the Night,*
Is quite obſcur'd by his emergent Light;
But Venus *only, as if more divine,*
With Phœbus *dares in Part'nerſhip to ſhine.*

Euphroſ. Well! ſhe's a matchleſs Planet, certainly, and I long to have a more intimate Acquaintance with her; therefore let me view her Complection, and ſee what Aſpect ſhe puts on to the Aſtronomer.

Cleon. That you ſhall do inſtantly; — this Gate is of a convenient Height;—there, the Tube is fixed, *Euphroſyne,* look thro' it in that Poſition.

Euphroſ. What is it I ſee!—not that bright, that glaring Star,—if ſo, the Glaſs diveſts her of all her radiant Glory,—ſhe ſeems a Moon in Truth;—a Moon in the firſt Quarter;—large as the Moon to the naked Eye;—but ſome-what more vivid, yet ſerene;—her Horns point upwards:—But, why does ſhe not appear with a full Face?——Is the Fault in the Glaſs, or what is the Reaſon?

Cleon. The Glaſs ſhews all of her that can be ſeen; the Reaſon why you ſee only Part of her Orb enlightened is evident from the Scheme; for let us ſuppoſe ſhe were viewed from her ſuperior Conjunction at D; then, becauſe all that Part of the Body which is turned towards the Sun is ſeen alſo from the Earth; ſhe muſt then appear *wholly enlightened*, and like the *Moon at full.*

Secondly, If ſhe were viewed in the Point A or G, then but half her enlightened Face could be ſeen at the Earth, and therefore ſhe would appear as the *Moon of a Quarter old.*

Thirdly, if we ſuppoſe her at V, in her inferior Conjunction; then all her light Part being turned to the Sun, nothing but her dark Part can be towards the Earth; and, like the *New Moon*, ſhe diſappears, and can't be ſeen, even with a Teleſcope, unleſs it be in the Face of the Sun.

Fourthly, In the Points B, more than half her enlightened Diſk will appear at the Earth, and in the Point C ſtill more than before; therefore in thoſe Places ſhe will appear gibbous.

Fifthly, In the Point X, between V and A or G, ſhe will appear horned, like the Moon about 3 or 4 Days old; which is the preſent Caſe of this Planet.

Euphroſ. But there is ſomething which yet ſeems ſtrange, and that is, *Venus* is now brighteſt, and yet but a ſmall Part of her enlightened Surface is towards us; pray, *Cleonicus*, as we walk home, give me to underſtand the Reaſon thereof.

Cleon. That you will eaſily perceive from the Scheme; for, *firſt*, if the Planet be at D, ſhe will indeed be a *Full Moon*; but then ſhe will be near three times farther from the Earth T than ſhe is now at X, and conſequently, ſhe will appear 7 or 8 Times leſs there (provided ſhe could be ſeen) than at X; tho' there we ſee but a Quarter of her enlightened Side, yet that will appear larger and more brillant than her whole Hemiſphere at D.

Again, at, and about her upper Conjunction at I, ſhe cannot be ſeen by Reaſon of her Nearneſs to the Sun; but getting farther out of the Sun-Beams, ſhe augments her apparent Size, and Luſtre, till ſhe comes near the Point X, where it is greateſt of all, as before ſaid, and then ſhe is about 40 Degrees diſtant from the Sun.

Euphroſ. I preſume, *Cleonicus*, I apprehend you full well; and thus, I ſuppoſe, as ſhe approaches to V, we gradually loſe Sight of her again.——

Cleon. Yes, unleſs ſhe ſhould chance to paſs over the Sun's Diſk, or Face (as I ſaid of *Mercury)* in her inferior Conjunction; and this ſhe will do in the Years 1761, 1769, 1996, 2004 in the Month of *June*; and in the Years 1874, 2109, 2117 in *December*; at which Times ſhe will appear a black, but beautiful Spot in the Sun.*

Euphroſ. Pray, how far is the Orbit of *Venus* from the Sun?

Cleon. About *Fifty-nine Millions of Miles*, that is, about *twice* as far off as *Mercury*; and therefore the *Light* and *Heat*, at *Venus*, will be but about a *fourth Part* of what it is at *Mercury*; and twice as great as ours.

Euphroſ. I recollect, you told me *Venus* ſpent 225 Days in revolving annually about the Sun; but pray, *Cleonicus*, has ſhe any Motion about her own Axis?

Cleon. Some ſay, ſhe has a diurnal Motion in 23 Hours; and others affirm, it is in 24 Days and 8 Hours; a very wide Difference indeed!——Such a Motion is diſcoverable only by Spots; and as I have never had it in my Power to procure a Teleſcope that would ſhew them, I can ſay but little about this Matter.

Euphroſ. What you now ſay is very extraordinary; I ſuppoſe thoſe Inſtruments are vaſtly expenſive; but if they are, one would think there were People of Fortune enough to render them more common, and to oblige every curious Perſon with the Uſe of them upon ſuch Occaſions.—But ſay, what is the Magnitude of *Venus*?

Cleon. She is computed to be a Globe of *Seven Thouſand Nine Hundred and Six Miles in Diameter*; and is therefore about 36 Times bigger than *Mercury*.

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* Of this curious Phænomenon we ſhall give a much larger and more particular Account in another Part of this Work.

Euphroſ. Well! I think we have talked her Ladyſhip out of Sight; for I can ſee her no where now.

Cleon. She is now gone to greet the jovial Sailors on the Weſtern Seas. For you know ſhe is, and ever was, the moſt of any Star admired and adored both by Land and Sea; and ſuch prodigious Veneration had the Ancients for her, that they made her their Favourite Goddeſs, and gave her all that Deity itſelf could claim. Thus one of their Poets ſings of her.

Delight of human, Kind and Gods above,
Parent of Rome, *propitious Queen of Love!*
Whoſe vital Power, Earth, Air, and Sea, ſupplies,
And breeds whate'er is born beneath the Skies.
For every Kind, by thy prolific Might,
Springs, and beholds the Regions of the Light.
Thee, Goddeſs! thee, the Clouds and Tempeſts fear,
And at thy pleaſing Preſence diſappear.
For thee the Land in fragrant Flowers is dreſs'd;
For thee the Ocean ſmiles, and ſmooths her wavy Breaſt,
And Heav'n itſelf with more ſerene and purer Light is bleſs'd.
DRYD. LUCRET.

DIALOGUE IX.

Of the EARTH; *conſidered as a* PLANET.

Euphroſyne.

THE next Orbit to *Venus* in the Solar Syſtem, I ſee, is that of the Earth.

Cleon. Yes; and thus Mr. *Baker* elegantly deſcribes the Earth's Motion.

More diſtant ſtill our Earth *comes rolling on,*
And forms a wider Circle round the Sun;
With her the Moon, Companion ever dear!
Her Courſe attending thro' the ſhining Year.
UNIVERSE.

Thus alſo Mr. *Brown*;

Lo! in the Midſt, fair Earth, *our native Seat,*
And her attendant Moon their Courſe repeat.

Euphroſ. At what Diſtance is the Earth's Orbit from the Sun?

Cleon. The Earth is removed to the Diſtance of about 80 Millions of Miles, which is ſuch a convenient Situation in the Syſtem, with Reſpect to *Light* and *Heat*, as admits of no Exceſs of either. And therefore Sir *R. Blackmore*'s religious Reflection on this Subject was very judiciouſly made.

See! how the EARTH *has gain'd that very Place,*
Which, of all others in the boundleſs Space,
Is moſt convenient, and will beſt conduce
To the wiſe Ends required for Nature's Uſe.
You, who the Mind and Cauſe ſupreme deny,
Nor on his Aid to form the World rely,
Muſt grant, had perfect Wiſdom been employ'd
To find, thro' all th' interminable Void,
A Seat moſt proper, and which beſt became
The Earth and Sea, it muſt have been the ſame.

CREATION.

Euphroſ. In what Time does the Earth make a compleat Revolution in its Orbit?

Cleon. In the Space of *Three Hundred Sixty-five Days* and a *Quarter*; which makes what we call our *Solar Year*. This is called the Earth's *Annual Motion*.

Euphroſ. I remember you mentioned another Motion of the Earth, which I have not yet ſeen in the *Planetarium*.

Cleon. Yes, my *Euphroſyne*; it has another Motion about its own Axis once in 24 Hours nearly, which is the Space of a natural Day; this is called the *Diurnal Motion*, and is the Cauſe of *Day and Night*; as the *Annual* or *Yearly Motion* is that from which the various *Seaſons of the Year* reſult.

Her Central *Motions give the* Night *and* Day,
And changing Seaſons *wait her* annual *Way.*

Prize Verſes, N°. IV.

Or thus;

The Earth, obliquely circling round her Sphere,
Leads on the varying Seaſons of the Year;
Whilſt on her Axle ſhe revolves with Speed,
The Days and Nights alternately ſucceed.

ANONYMOUS.

But the particular Manner in which the Viciſſitudes of Seaſons, and of Day and Night, are occaſioned and come to paſs, I ſhall take an Opportunity to explain to you another Time.

Euphroſ. You are very obliging, *Cleonicus*; but, pray, let me aſk you why the Orbit of the Earth is repreſented with all thoſe Diviſions and Figures about it?

Cleon. I will tell you, my *Euphroſyne*; the Orbit of the Earth is of great Conſequence, and therefore requires to be diſtinguiſhed from the reſt; for though it be the *real Path of the Earth*, it is the viſible or apparent annual Path, or Way of the Sun through the Heavens; and therefore, to denote the Sun's Place in the Heavens at any Time, the Aſtronomers have divided the whole Circle of his Motion into 360 equal Parts, which they call *Degrees*, and every 30 of theſe they call a *Sign*, of which there will be Twelve of Courſe.

Euphroſ. I obſerve, the Orbit is ſo divided as you ſpeak of; and I ſuppoſe thoſe Characters which I ſee, denote thoſe Signs reſpectively, but what are their Names, *Cleonicus*?

Cleon. The Names and Characters are as follow:

1. ♈, *Aries*, the Ram.
2. ♉, *Taurus*, the Bull.
3. ♊, *Gemini*, the Twins.
4. ♋, *Cancer*, the Crab.
5. ♌, *Leo*, the Lion,
6. ♍, *Virgo*, the Virgin.
7. ♎, *Libra*, the Ballance.
8. ♏, *Scorpio*, the Scorpion.
9. ♐, *Sagittarius*, the Bow-man.
10. ♑, *Capricornus*, the horned Goat.
11. ♒, *Aquarius*, the Waterer.
12. ♓, *Piſces*, the Fiſhes.

Euphroſ. What is the Reaſon they have ſuch Names given them?

Cleon. Theſe are the Names of ſuch Conſtellations of Stars as formerly occupied the Parts of the Heavens where the Signs are, but thoſe Stars are now removed forwards to other Signs, and have left only their Names behind; as we ſhall hereafter ſee.

Euphroſ. I think this Orbit, thus divided into Signs, is what you call the *Ecliptic* on the Planetarium; is it not, *Cleonicus?*

Cleon. The very ſame, my *Euphroſyne*; it is called the *Ecliptic*, becauſe, as it is the viſible Path of the Sun through the Heavens, all the *Eclipſes* muſt happen therein, as you will ſometime hence obſerve more ſenſibly.

Euphroſ. As there are 360 Degrees in the Ecliptic, and but 365 Days in the Year, I find the Earth muſt paſs over one of thoſe Degrees very nearly each Day.

Cleon. Yes, my *Euphroſyne*, it does ſo; each Degree is ſuppoſed to conſiſt of 60 *Minutes*, thus marked (′); and each *Minute* of 60 *Seconds* (″); each Second of 60 Thirds (‴); and ſo on. And the Earth each Day moves, at a Mean, 59′ : 8″ of a Degree.

Euphroſ. Well! I ſhall, by-and-by, not only *think*, but *ſpeak* like an *Aſtronomer*; as you make the firſt Sign (and conſequently the Beginning of the Ecliptic) to begin with the firſt Degree of *Aries*, pray, to what Day of the Year does this Point anſwer?

Cleon. According to the preſent New Style, it anſwers to the 21ſt of *March*; when the Sun is ſaid to be in the *Vernal Equinox*, for Reaſons you will hereafter be acquainted with.

Euphroſ. Is the Orbit of the Earth a perfect Circle?

Cleon. No, it is not; though it differs not much from it, yet it makes a ſenſible Difference in the Earth's Motion; for the Orbit being a little Eliptical, will cauſe that the Sun will be nearer the Earth at one Time than another; and that will make the Earth move a ſmall Matter faſter in one Part than it does in another, and conſequently that it will take up more Time, or a greater Number of Days in deſcribing one half of its Orbit, than it requires for the other; thus in paſſing through the ſix Signs ♎, ♏, ♐, ♑, ♒, ♓, it takes up 8 Days leſs, than in paſſing through the other ſix ſummer Signs, as you may underſtand by placing the Months and Days as follow:

Summer Months.		Winter Months.	
In *March*	10½	*September*	7
April	30	*October*	31
May	31	*November*	30
June	30	*December*	31
July	31	*January*	31
Auguſt	31	*February*	28
September	23	*March*	20½
Summer	186½		178½
Winter	178½		
Difference	8 Days.		

Euphroſ. Well, I never obſerved this before, though it be ſo evident from the common Almanack; but, *Cleonicus*, if our quicker Motion in the Winter proves we are then nearer the Sun, how comes it to paſs the Sun then ſeems fartheſt from us, and that ſo much the coldeſt Seaſons of the Year?

Cleon. Why, indeed, my *Euphroſyne*, theſe *Phænomena* are a little *paradoxical*, till you come to ſee this Matter ſet in a proper Light under all its Circumſtances, and then you will readily allow it muſt be ſo.

Euphroſ. But if the Sun be neareſt in the Winter, how is it, that it does not then appear larger than in the Summer?

Cleon. That is well obſerved, Siſter; but the Difference of Diſtance is ſo very ſmall as to make no ſenſible Difference in his apparent Magnitude; yet, were you to meaſure it with a *Micrometer* in a Teleſcope, you would find, that when the Sun is in the 8th Degree of ♑, his Diameter would meaſure 1967″, and when in the 8° of ♋, it meaſures only 1900″; leſs by 67″ than before, which is near a 30th Part of the Whole. You will at preſent believe what I ſay; but when we come to the practical Part of Aſtronomy, you will find it true by Experiment.

Euphroſ. You are very liberal in promiſing me great Things, *Cleonicus*, I ſhall be very happy in finding myſelf capable of them—But, pray, tell me what you know of the Form and Magnitude of the Earth.

Cleon. I will, my *Euphroſyne*; and therefore, firſt, as to the Figure or Form of the Earth, it is nearly that of a Globe or Sphere, as has been found by modern Diſcoveries moſt perfectly.

Euphroſ. Pray, in what Manner do you find this true, by Experiment?

Cleon. Several Ways, Siſter, as (1.) If you go directly North or South, you raiſe or depreſs the *North-Star* very ſenſibly, and always to equal Heights for equal Diſtances that you go; this Experiment I will one Day or other ſhew you. Now were you to walk ever ſo far on a Plane, the ſaid Star would ever appear of the *ſame Height* above the Horizon. (2.) If you ſtand on the Sea-coaſt, you will evidently obſerve the Convexity of the Surface of the Ocean; but more particularly you will be convinced of this, by obſerving a Ship ſailing directly from you; where you will gradually loſe Sight, firſt, of the Hull or Body of the Ship; and then of the ſeveral Sails; and, laſtly, the *Tops* of the *Maſts* diſappear. Now, were the Surface of the Sea a *Plane*, ſuch Appearances could never happen. (3.) The Shadow of the Earth in an *Eclipſe* of the Moon is obſerved to be *circular*, which it could not be unleſs it proceeded from a ſpherical Body.

Euphroſ. I make no Queſtion now of the globular Figure of the Earth, you have given ſufficient Proofs of it; and becauſe I think it a Matter ſo eaſily, and ſo fully proved by the two Obſervations you firſt mentioned; I wonder very much the Ancients ſhould be ignorant of it, or ever make any Difficulty about it.

Cleon. I think, indeed, it is a Matter of Wonder, for the Sages of Antiquity to have ſo great a Character for Wiſdom as they generally have, and yet were ſo ignorant of the eaſieſt and plaineſt Things in Nature; they moſt of them thought the Earth was a plain Surface, like a round Table, and that all below it was *Hades* or *Hell*, or, in ſhort, ſomething they knew not what; and whither the Sun, Moon, and Stars went to, and whence they came, each Evening and Morning, they could not tell. Yea, ſo very groſs were their Conceptions of theſe Things, that ſome of them thought the Sun, &c. did actually deſcend into the Weſtern Ocean, at Night, and aroſe out of the Eaſtern Ocean in the Morning. Thus *Ovid*,

The Sun did now to weſtern Waves retire,
In Tides to temper his bright World of Fire.

And it is extreamly diverting to hear *Epicurus* gravely recounting the ſeveral Methods by which to ſolve the daily Miracle of a New Sun kindling up the Lamp of Day, which was extinguiſhed every Night in the Waters of the *Hibernian* Seas. For thus he harangues us,

And Day may end and tumble down the Weſt,
And ſleepy Night fly ſlowly up the Eaſt;
Becauſe the Sun, having now perform'd his Round,
And reach'd, with weary Flames, the utmoſt Bound
Of finite Heaven, he there puts out the Ray,
Wearied and blunted all the tedious Day
By hind'ring Air, and thus the Flames decay:
Or elſe, becauſe the Fires abſorb'd at Night
There join again, and ſcatter vigorous Light.
Thus when the Morning Sun begins to riſe,
It's Flames lie ſcatter'd o'er the Eaſtern Skies;
Then gather'd to a Ball; and this we view
From Ida's *Top: this Fame reports as true.*
Nor is it ſtrange, that numerous Seeds of Fire
Should to the Eaſtern Quarter ſtill retire,
Still every Day return and make a Sun. CREECH.

Euphroſ. As they had ſuch aukward Notions of Things they every Day ſaw, I fancy it muſt be merry to hear them diſcourſe of ſuch Things as they never ſaw; for Inſtance, of their *Heaven* and *Hell*, and their different Opinions of departed Spirits, *&c.*

Cleon. Very much ſo indeed; they imagined all above the Sky was Heaven, and all below the Earth was Hell, as I ſaid but now; nay, they went ſo far as to find out the Way to Hell, if you believe their Poets. Thus *Virgil* deſcribes *Æneas*'s Deſcent thither,

Theſe Rites perform'd, the Prince without delay,
Haſtes to the nether World, his deſtin'd Way.
Deep was the Cave; and downward as it went
From the wide Mouth, a rocky rough Deſcent,
And here th' Acceſs a gloomy Grove defends,
And here th' unnavigable Lake extends. ÆNEID VI.

And in another Place;

To th' Shades you go a down-hill eaſy Way;
But to return and re-enjoy the Day!
That is a Work, a Labour———

Thus alſo *Ovid*,

Between thick baleful Yews, the dreary Way
To loweſt Hell, thro' diſmal Silence lay;
There Stygian Miſts infect the Road, and there
New Ghoſts, and thin unfuneral'd Souls appear.

Euphroſ. No more of this, *Cleonicus*; ſuch horrid Images ſhock me; it is a miſerable Thing to be a *mere Heathen!*—

Cleon. It it ſo,—without Honeſty; but the Figure of the Earth is not the Subject of Revelation, my *Euphroſyne*; and ſome of the Fathers of our Church have as gravely defended the *heatheniſh Figure* of the Earth, as if they had been the Deſcendants of *Ptolomy* himſelf. Nay, not many Ages ſince, the Doctrine of the *Antipodes* was zealouſly oppugned as a *damnable Hereſy*; and Hiſtory informs us, that the learned *Spigelius*, Biſhop of *Upſal*, ſuffered Martyrdom at the Stake in its Defence.

Euphroſ. Well, I could never have thought the Figure of the Earth had been ſuch an important Article of Faith. It is to be hoped we underſtand Religion better now a Days; for though I can ſcarce remember every one of the 39 Articles of our Faith, yet I am pretty well ſatisfied, neither the *Form* nor *Motion* of the Earth are any Part of any of them.

Cleon. They are not; and our Principles and Notions of Religion are much more correct and rational than they were formerly; and to what is this owing, my *Euphroſyne?* To our having a more correct and rational Philoſophy; you will find it a never-failing Maxim, that the better you underſtand *Philoſophy*, the better you will underſtand *Religion*. But this by the Way——

Euphroſ. Then let us return to our Subject; and ſee if I can underſtand what remains of the Philoſophy of the Earth. Pray, what is the Bulk or Magnitude of it?

Cleon. It is about *twenty-five Thouſand* and *twenty Miles in Circumference.*

Euphroſ. Well, that is a large Circuit, indeed; *Lord Anſon* might very well employ four Years in *going round the World.*

Cleon. True; but you muſt conſider, in ſuch Voyages it is impoſſible to go the neareſt Way; and they who go round the World, as you call it, go many Thouſand Miles more than the Earth is Round, as we ſhall hereafter ſee, when you come to the Uſe of the terreſtrial Globe—And this you obſerve, is another infallible Proof of the Earth's being of a ſpherical Form; for you may ſail almoſt upon a Circle from *Plymouth* to the *Antipodes*, and find that Diſtance about half the Number of Miles I before mentioned.

Euphroſ. You have fully convinced me the Earth is a *Globe*; but what is the Diameter of the Earth in Miles? I ſuppoſe you can tell that, as well as how much it is round.

Cleon. Juſt as well; the Diameter of every Circle is in reſpect to its Circumference nearly as 7 to 22, whence that of the Earth will be about 7960 Miles; and it is very remarkable, that the Planet *Venus* is much about as big, for the Diameter of that Planet is computed to be about 7906 Miles, which is but a Trifle leſs than that of the Earth.

Euphroſ. So that if we were placed in the Planet, we ſhould view the Earth as large as the Evening-ſtar, but not ſo bright—

Cleon. You would ſo, my *Euphroſyne*; but the Phaſes of the Earth would reſemble thoſe of *Mars*, and not of *Venus*. And I dare ſay you know the Reaſon of it.

Euphroſ. Becauſe the Orbit of the Earth is exterior to that of *Venus*—But one Thing I have often thought to aſk you, is, why the Earth and all the Planets move always one Way, and in ſo regular a Manner? Alſo how they, being ſuch large and heavy Bodies, can keep moving round at the ſame Diſtance, and not fall directly to the Sun?

Cleon. Sir *Iſaac* has ſhewn perfectly well how they move in Curves by a proper Compoſition of two Forces acting upon them at once; and the Direction of their Motion was at the Pleaſure of the firſt Mover, for nothing depends on that; therefore, Sir *Richard Blackmore*'s Banter on the Philoſophers upon this Subject, proved more his *own* than *their Ignorance*, when he thus ſneers them.

This Problem, as Philoſophers reſolve,
What makes the Globe from Eaſt to Weſt revolve?
What is the ſtrong impulſive Cauſe, declare,
That rolls the pond'rous Orb ſo ſwift in Air?
To their vain Anſwers will you have Recourſe,
And tell us 'tis ingenite active Force?
Mobility, or native Power to move,
Words which mean Nothing, and can Nothing prove.
CREATION.

Thus alſo the Author of *Univerſal Beauty*;

Say, why this Globe has its appointed Place?
And why not vagrant thro' the boundleſs Space?
Why here prefer'd, ſagacious to refuſe
What thwarts Propriety, Convenience, Uſe?
Why not more Neighbour to the burning Ray,
Or more remote from the declining Day?
Or here not ſedentary, fix'd and ſtill?
Admoniſh'd by no Voice, obſequious to no Will.
Or moving, why in circling Eddies round,
And not progreſſive thro' th' immenſe Profound?
Or endleſs, why the dizzy Drunkard reels,
And round the Sun its annual Motion wheels?
Whence is that innate delegated Power,
Central to ſpin the ſwift diurnal Tour?

Euphroſ. Why truely, I think a Woman, no wiſer than myſelf, might venture to ſay, that if the *Poetry* of theſe Lines were no better than the *Senſe*, they would be worth no Body's Notice. Theſe Gentlemen might juſt as well aſk, why the Hands of a Clock

THE NATURAL HISTORY OF *CORNWALL.*

WHAT we now call *Cornwall*, is the moſt weſtern Part of *Britain*, and but a Portion of what, in the Time of the *Romans*, was called *Dunmonium*. The Name of this County is variouſly accounted for, but the moſt eaſy and probable Derivation ſeems to be this: When the *Saxons* had driven the *Britons* into the Extremities of the Country, they called one Part of their Retreat *Wales*, the other Part to which the *Britons* retired, they called *Cornuuales*; either from the Shape of it, which reſembles a Hunting-horn;* or more probably, from the large Promontaries running out, like ſo many Horns, into the Sea: For the ancient *Britons* called a Horn, *Corn*; and Horns, in the Plural Number, *Kern*.

It is ſituated in 50° 30′ N. Lat. and 6° Long. being ſurrounded on all Sides by the Sea, except on the Eaſt; where it is parted from *Devonſhire* by the River *Tamar*. The northern Coaſt is waſhed by the *Briſtol* Channel, the Weſtern by St. *George's*, and the Southern by the *Britiſh* Sea. The Length, from Eaſt to Weſt, meaſures 70 Miles; the Breadth, in the broadeſt Part, next to *Devonſhire*, is reckoned to be about 40 Miles; but in the narroweſt Part, at St. *Ives*, it does not exceed five; yet it's Circumference is, by Reaſon of it's unequal Form, upwards of 233 Miles. It is obſerved by the People of *Falmouth* and *Truro*, that the Bounds of *Falmouth* Harbour only, running ſo very irregularly, and branching itſelf out into ſo many ſmall Parts, meaſure more than the Diſtance from *Falmouth* to *London*.

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* *Cornu* being the *Latin* Word for Horn.

The Air is ſharp, and conſequently healthful to the Natives. The Vicinity of the Sea, on three of its Sides, guards againſt hard Froſts, and prevents the Snow's lying long upon the Ground. The ſame Reaſon may be alledged for the frequent *Flaws**, as they call them, of Winds, which are very boiſterous, and oftentimes pernicious; yet the Inhabitants are rarely troubled with infectious Diſeaſes.

The Seaſons of the Year are ſomewhat different from thoſe in other Parts; the Summer being more temperate. The autumnal Fruits are later, their Harveſt being ſeldom ripe enough for the Barn 'till near *Michaelmas*.

The Soil, for the moſt Part, is mountainous, very ſhallow, covered only with a thin Coat of Earth, and rocky underneath, which renders it very difficult to be cultivated; and in dry Years unfruitful. The Valleys yield Plenty of Graſs, and the Land near the Sea-ſhore, being improved by a Sea-Weed called *Orewood*, mixed with a fat Sort of Sea-Sand, yields very large Crops.

Near the Sea-Coaſts are many very good Towns; but the middle Part of the County lies waſte and open; the Earth is of a blackiſh Colour, bearing little elſe but Heath, and ſpiry Graſs, fit only for breeding young Cattle.

The chief Rivers are, the *Tamar*, the *Camel*, and the *Fale*. The former runs a long Courſe from North to South, and is the Boundary between the two Counties of *Cornwall* and *Devonſhire*, emptying itſelf into *Plymouth Sound*. This River abounds with excellent Salmon. The *Camel* runs from South to North, and forms *Padſtow* Haven, in the *Briſtol* Channel. The *Fale* runs from North to South in the narrow Part of the County, and diſcharges itſelf into the *Engliſh* Channel, forming the Haven of *Falmouth*.†

This County is very remarkable upon two Accounts; the Firſt is of the *Inhabitants*, and the other of their great Plenty of Copper and Tin Mines, in which laſt Reſpect it is famed above all the other Parts of the World; as we were well aſſured, that one

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* *Flaw*, in the *Engliſh Corniſh-Vocabulary*, ſignifies to *cut*, perhaps from Φλαω to cut or bruiſe.

† The Reader will eaſily obſerve, that the River *Camel* gives Name to the Town of *Camelford*, which it runs through; and *Falmouth* is ſo called from being ſituated on the *Mouth* of the *Fale*. And this is to be obſerved, in general, for all Towns and Places whoſe Names end in the Words *Ford* and *Mouth*.

Tin Mine, in *Cornwall*, produced Tin of more Value in one Year, than ever the famous Mountain of *Potoſi* did of Gold in the ſame Time; and one Gentleman is poſſeſſed of a Tin Mine, at St. *Agnes*, for which he was offered 100 *l.* a Day for 6 Months, which he refuſed.

But with Regard to the Inhabitants: We ſhall do ourſelves no ſmall Credit to obſerve, that our Anceſtors, the *Britons*, muſt have been a worthy, and brave People, if we may judge of them by the genuine Remains in the County of *Cornwall*; for without Prepoſſeſſion or Flattery, we muſt ſay, that we obſerved ſuch a primitive Plainneſs and Simplicity of Manners, ſuch Singleneſs of Heart, and Sincerity of Intention, as we could not but admire and regard almoſt as a Novelty; thoſe People appearing ſo abſolutely unacquainted with, or ignorant of, Fraud and Impoſture, Diſſimulation and Flattery, as if they had never heard of any ſuch Thing; and if to this we add, a free, facetious, and generous Temper; a curious, and inquiſitive Diſpoſition, we ſhall not then have finiſhed the Character which they juſtly merit, 'till we have moreover mentioned their natural *Philanthropy*, or Humanity, and unparalleled Hoſpitality to Strangers; this every one muſt be a Witneſs of who has been among them, and muſt readily confeſs, if he does them Juſtice.

In Genius the *Corniſh* People are nothing inferior to the modern *Engliſh*; being great Encouragers of Arts and Sciences in general; and (as we found by Experience) particularly delighted with the Studies of Philoſophy, which we preſume will be allowed a very good Proof of a delicate and polite Taſte; and as we never but once ſaw an Eclipſe calculated by a Lady, we ought not to omit mentioning, that ſhe was of this County. As to mechanic Arts, no one will wonder if we ſay they excel in them. Not only their Genius, but their Buſineſs, give them a particular Bias to ſuch Kind of Studies and Inventions; and in the laſt Place, what regards their commercial and mercantile Character is well known to all the World, without our mentioning any Thing particular on that Head. We ſhall ſay no more, nor could we ſay leſs, as it reflects great Honour upon the *Engliſh* Nation in general, to ſee the Offspring of our ancient Stock appear in ſo good a Light at this Diſtance of Time, and as it may tend to remove thoſe groundleſs Jealouſies which they are a little too much inclined to entertain, of their making a leſs Figure in the Eyes of the *Engliſh* than they really do.

We proceed next to give an Account of the natural Produce of the County: and firſt of the Rock called *Wringcheeſe*.

It conſiſts of a Groupe of Rocks, which are the Admiration of all Travellers. On the top Stone were two regular Baſons; but Part of one of them has been broke off. This Stone, as we are informed, was a Logan or Rocking-ſtone, and when it was entire, might be eaſily moved with a Pole; but now great Part of that Weight which kept it on a Poiſe is taken away. The whole Heap is about 30 Feet; the great Weight of the upper Part, and Slenderneſs of the under, makes every one wonder, how ſuch an ill-grounded Pile could reſiſt, for ſo many Ages, the Storms of ſuch a Situation. It may ſeem to ſome that this is an artificial Building of large flat Stones, laid carefully on one another, and raiſed to this Height by human Skill and Labour; but as there are ſeveral Heaps of Stones, on the ſame Hill, and alſo on another about a Mile diſtant, called *Kell-Mar's*, of the like Fabric, tho' not ſo high, we think it a natural Crag, and that the Stones which ſurrounded it, and hid its Grandeur, were removed by the *Druids*. Mr. *Norden*, in his Deſcription of *Cornwall*, ſays, they were left in this Poſition at the univerſal Deluge, by the Force of the Water, which deprived them of the Earth, and other Means of Support, and they remain thus depending without the Aſſiſtance of Art. Mr. *Borlaſe* is of Opinion, from its having Rock-baſons; from the uppermoſt Stone's being a Rocking Stone; from the well-poiſed Structure, and the great Elevation of the Groupe; that it may be reckoned among the Rock-Deities: and that its Height and juſt Balance, might probably be intended to expreſs the Statelineſs and Grandeur of the Supreme Being. And as the Rock-baſons ſhew it was uſual to get upon the Top of this Karn, or Heap of Rocks, it might probably ſerve for the *Druids* to harangue or foretel future Events on.

There is another Kind of Stone-Deity, that has not been taken Notice of by any Author, we know of. It's common Name in *Cornwall*, and *Scilly*, is *Tolmên*; that is, the Hole of Stone; being a large orbicular Stone, ſupported by two others; betwixt which there is a Paſſage. There are two of theſe in the *Scilly*

Iſlands; but the moſt aſtoniſhing of this Kind, is in the Pariſh of *Conſtantine*, in *Cornwall*. It is one vaſt oval Pebble, placed on the Points of two natural Rocks, ſo that a Man may creep under the great One, between its Supporters, through a Paſſage three Feet wide, and of equal Height. The longeſt Diameter of this Stone, is 33 Feet due N. and S. it is 14 Feet 6 Inches deep, and 18 Feet 6 Inches wide, from Eaſt to Weſt, and 97 in Circumference. The Top of it, which you aſcend by a Ladder, is worked into Baſons, like an imperfect Honey-comb; one of which, at the South End, being much larger than the reſt, is about ſeven Feet long; another, at the North, about Five; the reſt ſmaller, ſome not more than one Foot, others not ſo much, the Sides and Shape irregular; moſt of theſe Baſons diſcharge into the principal Ones, but thoſe near the Brim of the Stone have little Channels which diſcharge the Water they collect over the Sides of the *Talmên*, and the flat Rocks which lie underneath receive the Droppings into Baſons that are cut on their Surfaces. This Stone is no leſs wonderful for its Poſition, than for its Size; for the ſlender Part is nearly ſemicircular, yet it reſts on two large Rocks, and only touches the two under Stones, as it were, on their Points. Notwithſtanding this, we are of Opinion, this Stone was never moved, ſince it was firſt formed, but only cleared from the reſt of the Karn, and ſhaped ſomewhat to keep it in proper Poiſe; and to ſhew itſelf to that Advantage it now does in a ſurprizing Manner at ſeveral Miles Diſtance.

In the Area below this Stone are many large Rocks, which have certainly been ſplit and divided, but whether thrown down from the Sides of the *Talmên*, or not, we will not determine. One Thing however is remarkable, that theſe *Talmêns*, both in the Iſland of *Scilly*, and *Cornwall*, reſt on Supporters, and do not touch the Earth, agreeable to an eſtabliſhed Principle of the *Druids*, who imagined every Thing that was ſacred, would be prophaned by touching the Ground, and therefore ſo ordered it, that theſe Deities ſhould reſt upon the pure Rock, that they might not be defiled by touching the common Earth.

Among the curious rude Reliques of Nature in this County, we muſt not paſs by the Logan, or Rocking-ſtone, of which there are two Sorts, ſome artificial, others natural; we ſhall take notice only of the laſt. In the Pariſh of St. *Levin*, in this County, there is a Promontory, called *Caſtle-Treryn*. This Cape conſiſts of three diſtinct Groupes of Rocks. On the Top of the middle Groupe of Rocks, (which we climbed with ſome Difficulty and Hazard) we there obſerved the moſt wonderful Logan-ſtone, perhaps, in the World; one of our ingenious Companious took the Dimenſions of it, and computed the ſolid Content, which amounted to about 95 Tons; the two inclined Sides ſomewhat reſemble the two Roofs of a Houſe, meeting in a Sort of obtuſe Ridge upon the Top. The lower Part of the Stone is a large plain Baſe, near the Middle of which, projects a ſmall Part on which it reſts, which Part ſeemed to be of a round Form, and not to exceed more than 18 or 20 Inches in Diameter. The lower Part of this too, was ſomewhat convex'd, by which Means, as it was equally poiſed on this Part, it became eaſily moveable upon the large Stone below, the Poſition of which was moſt of all wonderful, as the Surface on which the Logan-ſtone reſted was conſiderably inclined; ſo that, at firſt Sight, it ſeemed as it were eaſy to heave the Logan-ſtone off, but on Trial, we found, that we could produce no other Motion than that of Libration, the Power of one Man being only ſufficient to move it up and down about half an Inch. It is ſo high from the Ground, that no one who ſees it, can conceive it could be lifted up to the Place where it now reſts. It makes a natural Part of the Crag on which it at preſent ſtands, and always ſeems to have belonged. There is alſo a natural Logan-ſtone in the large Heap of Rocks, called *Boſworlas-Lebau*, in the Pariſh of St. *Jus-Penwith*. Alſo theſe Stones ſhew by their Situation, that they were never placed there by Art or human Force. There is a very remarkable Stone of this Kind in the Iſland of St. *Agnes*, in *Scilly*. In the Pariſh of *Sithney*, ſtood the famous Logan-ſtone, called *Mên-amber*, which is 11 Feet long from Eaſt to Weſt, 4 Feet deep, and 6 Feet wide. This top Stone was ſo nicely poiſed, that, “ a little Child, as Mr. “ *Scawen* in his M. S. ſays, could inſtantly move it;” but in the Time of *Cromwell*, when all monumental and curious Pieces of Antiquity, that Ignorance and fiery Zeal deemed ſuperſtitious, not only grew into Contempt, but which it was reckoned a Mark of Piety to deface or deſtroy, one *Shrubſall*, Governor of *Pendennis*, with much ado, cauſed it to be undermined and thrown down, to the great Grief of the Country. “ In *Cornwall*, ſays

“ Mr. *Borlaſe*, we call it the Logan-ſtone, the Meaning of which
“ I do not underſtand. Logan, in the *Guidhelian Britiſh*, ſignifies
“ *a Pit*, or *Hollow of the Hand*; and in ſuch Hollows, this mov-
“ ing Stone is often found; but whether the Word Logan be
“ thence derived, or is a Corruption of the *Britiſh Llygadtyn*,
“ which in *Welſh*, ſignifies, *bewitching* (the ſingular Property of
“ this Stone ſeeming the Effect of Witchcraft) I ſhall not en-
“ quire.”

Some Authors take ſeveral of theſe Stones to be placed in this Poſition by human Art; and we muſt own, it is not at all improbable, that the *Druids*, who pretended ſo much to the Art of Magick, the ſole Buſineſs of which is to deceive, obſerving this uncommon Property in the natural Logan-ſtones, ſoon learned to make uſe of it as an occaſional Miracle, and where they had no natural, made artificial ones, and conſecrated them. They then pretended Spirits inhabited them, and very probably inſiſted upon this Motion, as a Proof of thoſe Spirits reſiding in them, and ſo they became Idols.—As it is always the Buſineſs of thoſe who make uſe of pious Frauds, to encreaſe private Gain, and eſtabliſh an ill-grounded Authority, by deluding the common People under a Pretence of a new Commiſſion.

The Language of the *Corniſh* Gentry and Yeomanry is *Engliſh*, and as pure as in *London*; unleſs it be in two or three Pariſhes near the Land's End, where a corrupt Dialect of the ancient *Corniſh* Tongue is much uſed.

Of tame Cattle, they have all the ſeveral Kinds with other Counties: What is peculiar to this County, is their Sheep; which, when it lay open and uncultivated, were a ſmall Breed, and their Wool ſo coarſe, that it was uſually called *Corniſh* Hair; but ſince their Lands have been well manured and tilled, they now equal the Sheep of other Countries, in Size, in Fineneſs of Staple, and excel moſt in Sweetneſs of Taſte, and Soundneſs of Fleſh. They obſerve, thoſe that have no Horns, yield the fineſt Wool, though not ſo much as thoſe that have. Their Cows and Oxen are ſmall, but their Fleſh ſweet and juicy; and becauſe they often meet with good Markets for victualling of Ships, and ſometimes for Exportation, they are encouraged to rear a great Number for Slaughter. They uſe their Oxen chiefly in ploughing.

Their Horſes are bred hard, and fed as coarſely, and though of low Stature, travel well, and are very ſerviceable in that mountainous Country. They are naturally of good Courage; but by hard Labour, in carrying Sand for Tillage (when they are young) they are brought off their Mettle, and become dull and ſluggiſh. Mules are here much uſed (and very deſervedly) being a Beaſt of Burden, that will fare hard, and live long.

There are in this County many Parks, well ſtocked with fallow Deer; but they have no red Deer, except what ſtray thither out of *Devon*. Many Otters, Badgers, Martens and Foxes, harbour in the Cliffs near the Sea-ſide, which make good Sport for the Gentlemen.

The Fruits and Herbs of this County are much the ſame with thoſe of others, though not ſo plentiful among the common People. It has beſides the common Herbs, ſome, either not found out at all, or not ſo plentiful in others, namely, the ſmall creeping round-leaved baſtard Chickweed, which grows on moiſt Banks in many Places. The Marſh-Aſparagus, or Perage, which is found growing on the Cliffs at the *Lizard-point*. Round-leaved Marſh, St. *Peter's* Wort, in Abundance near the Land's End; tender Ivy-leaved Bell-flower, on moiſt and watery Banks; the leaſt Marſh Centaury, on a rotten boggy Ground, between St. *Ives* and *Penzance*; Fir-leaved Heath, with many Flowers; great Yellow-marſh Eyebright; ſmall Sea Crane's-bill, with Betony Leaves; Sea-cotton Weed; creeping Cocksfoot; Rupture-wort; the leſſer Autumnal-ſtar-jacinth, and *Engliſh* Sea-peas. To which we ſhall add, a Sort of Grain ſown plentifully towards the farther End of this County; which is, naked Oats, called Pill-corn, from its being naturally ſtripped of its Huſk, with which the common Oat is covered; for this Reaſon it is much eſteemed, and as dear as Wheat. They have alſo Plenty of Sea Herbs, as Camphire, Sea-holly, Eringo, Ros Solis, and Palamontain; with many fragrant Herbs, as Marjoram, Roſemary, and the like, which grow wild upon the Cliffs. Another Thing peculiar to this County is, that no *Sweet-Brier* naturally grows here.

From the Surface we ſhall paſs into the Bowels of the Earth, where are found many Sorts of Stones and Metals. As to Stones, the *Moor-ſtone* is the Chief, ſo called, becauſe it is found in ſwampy, mooriſh Ground, but a *Moor* in the weſtern Parts of *England* denotes (not low and marſhy, but) high and mountainous Parts of Land; thus *Dart-moor* is the moſt mountainous Part of *Devonſhire*, and the higheſt Lands in *Cornwall* are uſually called *Moors*, and hence it is, that what is called *Moor-ſtone*, is always dug out of thoſe high Lands and Hills; thus the famous Rock, called *Kernbrey*, near *Redruth*, conſiſts for the moſt Part of *Moor-ſtone*, and ſome of the fineſt that the County affords: we here obſerved large Poſterns, ſquare Pillars of great Lengths, the largeſt ſize Mill-ſtones, *&c.* formed of this Stone. The natural Compoſition of this Stone is beautiful to the Eye, conſiſting for the greateſt Part of a whitiſh, granulated Marble, interſperſed and variegated with a Sort of black and yellow Matter, that looks like Tinſel and Tin-Glaſs, ſhining and glittering very agreeably in the Sun-beams; this Stone therefore gives a glorious Aſpect to Buildings while new; but the Misfortune is, it is ſoon affected by the Weather, and though prodigiouſly hard at firſt, will, by imbibing Salts and other corroſive Matters from the Air, ſoon change its Colour and firm Conſiſtence, and therefore makes but a bad Appearance in old Buildings. We were told by thoſe who have ſeen this Stone poliſhed, that it appears much more beautiful and ſplendid than any of the Marble-kind, and makes the richeſt Furniture of Tables, Chimney-pieces, *&c.* but being ſo exceeding hard, the poliſhing it is very expenſive, *viz.* 2*s.* 6*d.* per ſquare Inch.

With regard to the Mines of *Cornwall*, they conſiſt of two Sorts, one of Tin, the other of Copper; thoſe of Tin are very numerous over more than half the County, and are in general very large and rich in *Ore*; theſe Mines have rendered this County famous in all Ages above any other Part of the World: There are alſo a great Number of large and rich Copper-Mines, beſides many of leſs Note. As to Silver and Gold, there has been ſometimes a ſmall Matter of either found, but nothing deſerving Notice. With the Metalline Ores they have large Quantities of *Mundic* intermixed, and a conſiderable Quantity of *Arſenic*.

The Tin-works are of two different Sorts, on Account of the two different Forms in which the Tin appears; for, in many Places, the Tin-Ore is produced in the Earth, in the Form of Stones or Pebbles, and ſo much like common Stones, that they can be diſtinguiſhed from them only by their Weight; for ſuppoſing the ſpecific Gravity of pure Tin to be as 7, that of common Stone is as $2\frac{1}{2}$, but that of Tin-Pebbles is generally as $3\frac{1}{2}$, 4, $4\frac{1}{2}$, and the beſt 5; by which ſuperior Weight they are known, and generally ſought after by the common People in all ſuch Places where they can be found near a Stream of Water; for by this Means they waſh away the Earth from the Pebbles and mineral Stones, which they keep moving about with a Shovel while the Water runs through it, and when the Earth is waſhed from them they are thrown by in a Heap; very often theſe Pebbles are found on the Surface of the Earth, but moſtly generated within the Earth at the Depth of 8, 12, or 20 Feet from the Surface: Here great Labour is required in digging away the Earth, and producing artificial Streams of Water by Means of Rag-Wheels and other Contrivances, of which we ſhall hereafter give a more particular Account in our Treatiſe of Mineralogy. This Method of procuring Tin is called *Stream-work*, the largeſt of which is that in the Road from St. *Auſtle*'s to *Polgooth*.

The ſecond Form in which Tin appears, is that which we call Ore, conſiſting of Tin and Earth compounded, and concreted into a Subſtance almoſt as hard as Stone, of a bluiſh or greyiſh Colour, and often the *Mundic* gives it a yellowiſh Caſt: This Ore is always found in a continued *Stratum*, or Bed, which the Tinners call the *Load*, and this, for the moſt Part, is found running through the ſolid Subſtance of the hardeſt Rocks, beginning in ſmall Veins near the Surface, perhaps not above half an Inch, or Inch wide, and increaſing as they go into larger Dimenſions, and branching out into ſeveral Beds, or *Strata*, and proceeding downwards in a Direction generally nearly Eaſt and Weſt.

Theſe *Loads* are ſometimes very wide and thick, ſo that great Lumps, or Stones of this Ore, are often drawn up of more than 20*l.* Value; the *Loads* of Tin-Ore are not always contiguous, but ſometimes break off ſo intirely, that you would think you were juſt got to the End of it; but here the ſagacious Tinner is not diſappointed; for by Experience he knows, that by digging ſome little Diſtance on one Side, he ſhall meet with the ſeparated, remaining Part of the *Load*, appearing to tally with the other End ſo nicely, as if it had been broken off by ſome ſudden Shock or convulſive Motion in the Rock: Theſe *Loads* of Tin-Ore are ſaid often to be diſcovered by *Shoad-ſtones*, which are only Parts of the Rock where ſuch Ore abounds broken off, and rolling down the Declivities of the Mountains, are by Torrents ariſing from great Rains, and other Accidents, carried to a great Diſtance, ſometimes two or three Miles, where they are obſerved by a Set of People, who make it their Buſineſs to inveſtigate, by their Means, the mineral Rock to which they originally belong, and there find the expected *Load* of Ore. We ſhall take no Notice here of another Method which ſome pretend to of diſcovering the *Load*, *viz.* by what they call the *Virgula Divinatoria*, or Nodding Rod, which is a forked Hazle Wand, which they carry upright before them in both their Hands while they walk along, and when they come over the *Load*, the ſaid Rod will dip forward, and by that Means indicate the ſame; but we ſaw no Experiment to confirm the Truth of this.

But after all, the moſt common and certain Method of diſcovering the *Load*, is by frequently digging to the Depth of a few Feet in ſuch Places as they have good Reaſon to expect it; this is often done by common People, who thus find the beginning Veins, and purſue them till the *Loads* become larger, and entering deep into the Rock, or flooded by Springs, the Labour and Expence is too great to be ſupported, and they are obliged to reſign ſuch Diſcovery to People of ſuperior Fortune, who by Means of large Water-wheels, or Fire-Engines, are enabled to keep on the Work, and follow the *Load* in all its rich and meanderous Windings in the Bowels of the rocky Earth. Sometimes the Waters are drained from thoſe Mines by ſubterranean Paſſages carried on from the Level of the Country through the Baſis or Body of the Mountain, till they arrive at the Mine; theſe they call *Adits*, which ſometimes prove the Labour of many Years, and great Expence; but when effected, they ſave the conſtant Charge of the Fire-Engines and Water-works before mentioned. From the Surface of the Earth they ſink a Paſſage to the Mine, which they call a *Shaft*, over which they place a large Winch, but in the larger Works a Wheel and Axle, (which they call a Whim) by which Means they draw up large Quantities of Ore at a Time in Veſſels they call Kibbuls; this Ore is thrown into great Heaps, where great Numbers of poor

People are employed in breaking it to Pieces, and fitting it for the Stamping-Mills, which Proceſs, together with others, fitting it for the Smelting-Houſe, will be treated of more largely in the Mineralogy.

And the third Form in which Tin appears, is that of *Cryſtals*, for Tin (as well as other Metals) being a *Salt*, will under ſome Circumſtances readily cryſtallize; and therefore in many Parts of the mineral Rocks you find the moſt perfect, tranſparent, and beautiful Cryſtals of pure Tin, without any Admixture of Earth.

The Copper-Mines of this County next deſerve our Notice, as they are very numerous, and ſome of them very large and rich in Ore; they moſtly abound where the Tin-Mines do, and ſometimes are found very near them, the *Loads* of Tin and Copper Ore being often found to run for a long Way together in parallel, though contrary, Direction; the Copper-Ore does not contain ſo great a Quantity of Metal in Proportion to its Bulk as Tin-Ore, yet are they as good here as in moſt Parts of the World; and it is very remarkable, that in ſome Parts of *Cornwall* the Earth has been ſo exuberant in the Production of this Metal, as to afford it in large, maſſy Lumps of malleable Copper, ſeveral Pieces of which we have ſeen in very curious, vegetable Forms; the Chief of theſe *Loads* of pure Copper was that, a few Years ago, diſcovered between *Helſtone* and the *Lizard's Point*, which was ſoon exhauſted.

In the Copper and Tin-Mines is found a very large Quantity of *Mundic*, adhering to the Ore, as we have before obſerved, which they are obliged to burn away in very large Ovens for that Purpoſe, in order to purify, and fit the Ore for Smelting; beſide this, it is found in very large Quantities by itſelf, conſiſting of ſmall Pieces of a cubic Form, of a yellow Colour, and from its Weight and Appearance reſembling a metallic Subſtance; but its chief Compoſition is of Earth and Sulphur, on which Account an Undertaking was ſet on Foot, ſome Time ago, for making large Quantities of Sulphur from this Foſſil; but not anſwering what was expected, it ſoon dropped, and there is now no Uſe made of it at all. Large Quantities of *Arſenic* are collected from the Steam of melted Tin-Ore, in proper Funnels, and Rooms for that Purpoſe, in thoſe they call *Blowing-*

Houſes, or thoſe Smelting-Houſes where *Bellows* are employed, which now are but few, the Chief of which are near St. *Auſtle's*.

In many Places, the Rocks which produce the mineral Ore are found to conſiſt of many different Sorts of Stone, ſome of which are very hard, and others very ſoft; ſome very compact, and others remarkable for their particular Conſiſtence, being of curious thin *Lamina*, like the Leaves of a Book, and into which the Stone reſolves itſelf, after it has lain ſome Time in the open Air. Great Quantities of this Stone are found about *North-Down*, and many other Places.

In many of the Hollows and cavernous Parts of the Rocks are found many of thoſe fine, tranſparent Cryſtals which are known by the Name of *Corniſh Diamonds*; for they are hard enough to cut Glaſs, and are extremely brilliant when well poliſhed: Their Form is that of a ſix-ſided Priſm, pointed on the Top; theſe are, ſometimes, four or five Inches in Length, and ſome we have ſeen near two Inches in Diameter; they are principally uſed for Grotto-work, and for ſuch-like Purpoſes.

All the Parts of *Cornwall*, on this Side St. *Auſtle's*, St. *Michael's*, and St. *Agnes*, have little or nothing of Mineral Ores, but abound moſtly with Rocks of blue Slate, eſpecially towards the South, where we find many large Quarries of this very uſeful Foſſil. It is ſome-what obſervable, that very few, if any, of the Foſſil-Shells are found in the Earth, or Stones, of this County, where one might expect to find them in the greateſt Plenty; we were told, that now and then ſome Pieces of *Magnet* were found, but very imperfect, and of no conſiderable Virtue. There is in one Part, near St. *Agnes*, a very fine Sort of Earth as white as Chalk, but of a much ſofter Conſiſtence, and not in the leaſt brittle; the like of which we have not ſeen in any other Place.

We ſhall now take a curſory View of what appeared to us remarkable in thoſe Parts of the *Corniſh* Shore, which we had an Opportunity of obſerving. In the rocky Cliffs, at St. *Agnes*, you deſcend, on one Part, to a great Depth, and view, in the other Part before you, the largeſt and richeſt *Load* of Tin-Ore, running, for many Rods in Length, in the ſolid Rock, being the external Part of that very extraordinary Mine we referred to in Page 3, the Property of Mr. *Donithorne*, and ſuch another View, perhaps, the World does not afford.

At this Place, in the Creek among the Rocks, was taken a ſingular, and moſt extraordinary Sea-Animal, which we think may be properly called a *Sea-Polypus*: It conſiſt[illegible] ſmall Body about the Bigneſs of the Palm of the Hand, to which was annexed a hollow Pouch, and on the middle Part of the Body was a curious Beak, or Bill, about an Inch and Half long, and three Quarters of an Inch wide, of a roundiſh Form, a Tortoiſe-ſhell Colour, and curved ſome-what like a Parrot's Bill; from the Body proceeds eight Legs, nearly at an equal Diſtance from each other, about an Inch and Quarter wide at the Body, and nearly 30 Inches long, of a tapering Form, terminating in a Point at the Extremity; the Legs were of a fleſhy and membranous Subſtance, and thick ſet with ſmall Pouches, or Holes, (about half an Inch wide the largeſt) diminiſhing gradually towards the Extremity, in each Leg. Theſe Holes ſeemed deſtined to anſwer the Deſign of Gills, in common Fiſh; of theſe Holes there were between 30 and 40 in each Leg. Theſe Legs were all contracted and encloſed in the Pouch, or looſe Bag, on one Side the Body, and the Animal lay, ſeemingly, aſleep, when firſt obſerved; the Perſon, however, ſtriking it with a Stick, it expanded its Legs with great Violence, and put itſelf, as it were, in a Poſture of Defence; but, by repeated Blows, it was ſubdued, and as it appeared of ſo ſurpriſing a Form, and ſuch an Animal never before obſerved, we have thought the Repreſentation of it, hereto annexed, would be very acceptable to our Readers.

The Bay of St. *Ives* is very remarkable for the prodigious Quantity of fine, light Sand, which the Wind raiſes into Clouds, overwhelming the Country for a Mile or two, and the Houſes of nearly half the Town. Another Thing remarkable is the vaſt Quantity of fine, black, Marble-Pebbles found here, with which the Streets of St. *Ives* are paved, which being, naturally, very ſmooth, and ſlippery, make it very difficult, and even dangerous to walk the Streets in rainy Weather. A Stranger is here very much entertained, likewiſe, with a ſurprizing Quantity of black Muſcles, growing in large Cluſters, and Patches, on all the Rocks in this Part of the Coaſt, forming the Bay next the Town. Here are likewiſe great Variety of curious Shells, variegated with fine Colours, particularly of the Limpet-Kind.

At the Land's End, the fartheſt Point of Land conſiſts of a Ridge of very ſteep Rocks, projecting, beyond the reſt, into the Sea; in which, at the Bottom, we obſerved three large Arches, through which the Waters, of the Sea, ran with great Rapidity, Violence, and Noiſe. Here are alſo found Sea-Shells in greater Quantity, and Variety, and more beautifully coloured, than in any other Part of the *Britiſh* Coaſt, which they ſell very cheap, by which many Families get a Subſiſtence.

In *Mount's Bay*, near *Penzance*, the Shore is, as it were, paved with a rocky Stone, of ſo fine a Grain, that it equals any Hone in giving an exquiſite Edge to a Razor; and 'tis ſomewhat to be wondered at, that this Stone is not more made uſe of by Artificers for their finer Sort of edged Tools.

In this Bay, we find the moſt remarkable Mount in the World, called St. *Michael's Mount*, ſituated near *Marazion*, wholly ſurrounded at high Water, but at low Water, there is a Neck of dry Land, like a Cauſe-way, which joins it to the Shore, by the Town. This Mount is upwards of a Mile in Circumference at its Baſe, and riſes, tapering, in a beautiful Manner, towards a Point, to a very great Heighth; on the Top of which is a large Fabric, belonging to Sir *John St. Albans*, remarkable for St. *Michael's Chair*, in which, if a Perſon ſits, he views the perpendicular Steepneſs of the Mount, and the Rocks and Water appear tremendous below; by this Experiment a Perſon may find the Strength of his Mind, and Steadineſs of his Head. It conſiſts of one large, ſolid Rock, the upper Parts of which are covered with Earth, which produces large Quantities of Graſs, Herbs, Shrubs, &c. which give it a very pleaſant Verdure; but the lower Parts, or Baſis, of the Rock lie intirely naked, and ſpread themſelves wide around, towards the South eſpecially, where it is very pleaſant to obſerve numerous Loads of Tin running about, in ſmall Veins, through ſeveral Parts on the Surface, and entering deep into the Rock. This Mount makes a noble Spectacle at the Diſtance of three Miles from *Penzance*, and over all the adjacent Country.

On the Coaſt near *Helſtone*, is a very famous Lake, called *Loo-pool*, near two Miles long, formed by a Conflux of Rivulets, and parted from the Sea by a wide and ſtrong Beach of Sand and Pebble; through which the Waters of the *Sea and*

Lake are ſuppoſed to communicate by Percolation; for the Waters which run into the Lake have no viſible Diſcharge, and the Waters of the Lake are conſiderably *ſalt*, which cannot be well accounted for, by the Sea overflowing the Beach now and then. Here are various Sorts of Fiſh, and ſome peculiar to this *Lake*.

About Half-way, between this and the *Lizard's Point*, we find the firſt of the two *Soapy Rocks*, ſo called, becauſe the Earth has a great Reſemblance to Soap, though it has no other of its Properties, but that of Smoothneſs and Lubricity, or Slipperineſs; for it will not lather or ſcour like real Soap. The Earth is extreamly white and ſoft in ſome Parts of the Rock, in other Parts it is ſtreaked with Red, and in others of a motley Colour; it is found in various *Strata*, in the Interſtices of the ſtony Rock, and the whiteſt and fineſt Part lies deepeſt of all, and is in ſmall Quantities; the very Pebbles of this Earth ſeem to be of a ſaponaceous Conſiſtence or ſmooth Pieces of petrified Soap. This Earth is the principal Ingredient in the Manufacture of *Engliſh China*.

The other ſoapy Rock is about five Miles farther on; the Earth found in this Rock is much more in Quantity, but greatly inferior to the other in Colour and fine Conſiſtence, nor has it by near ſo much the Look of Soap; it is made uſe of for the ſame Purpoſe as the other, *viz.* for making *China*.

As for the Fowl of this Country, they are generally ſuch as are found in others; the wild Fowl are very plenty in the Parts adjoining to *Devonſhire*; thoſe Birds, called the *Choughs*, which are peculiar to this County, are found in great Plenty, and ſomewhat reſembling the pied, or grey *Crow*, but of a leſs Size. The moſt remarkable among the Water-fowl, is one about the Bigneſs of a *Sea-gull*, which has a ſingular Method in taking its Prey; for it riſes high in the Air, and from thence falls as if dead to the Surface of the Water, and by the Velocity of the Fall, is by that Means enabled to penetrate the Element, and ſuddenly ſeize the Fiſh it ſtrikes at; theſe are ſeen in very great Numbers in *Mount's Bay*, and other Parts of the Sea-Coaſt that Way.

They have great Plenty of Fiſh in the Rivers and Seas, but moſtly ſuch as are common to other Countries; but we cannot here

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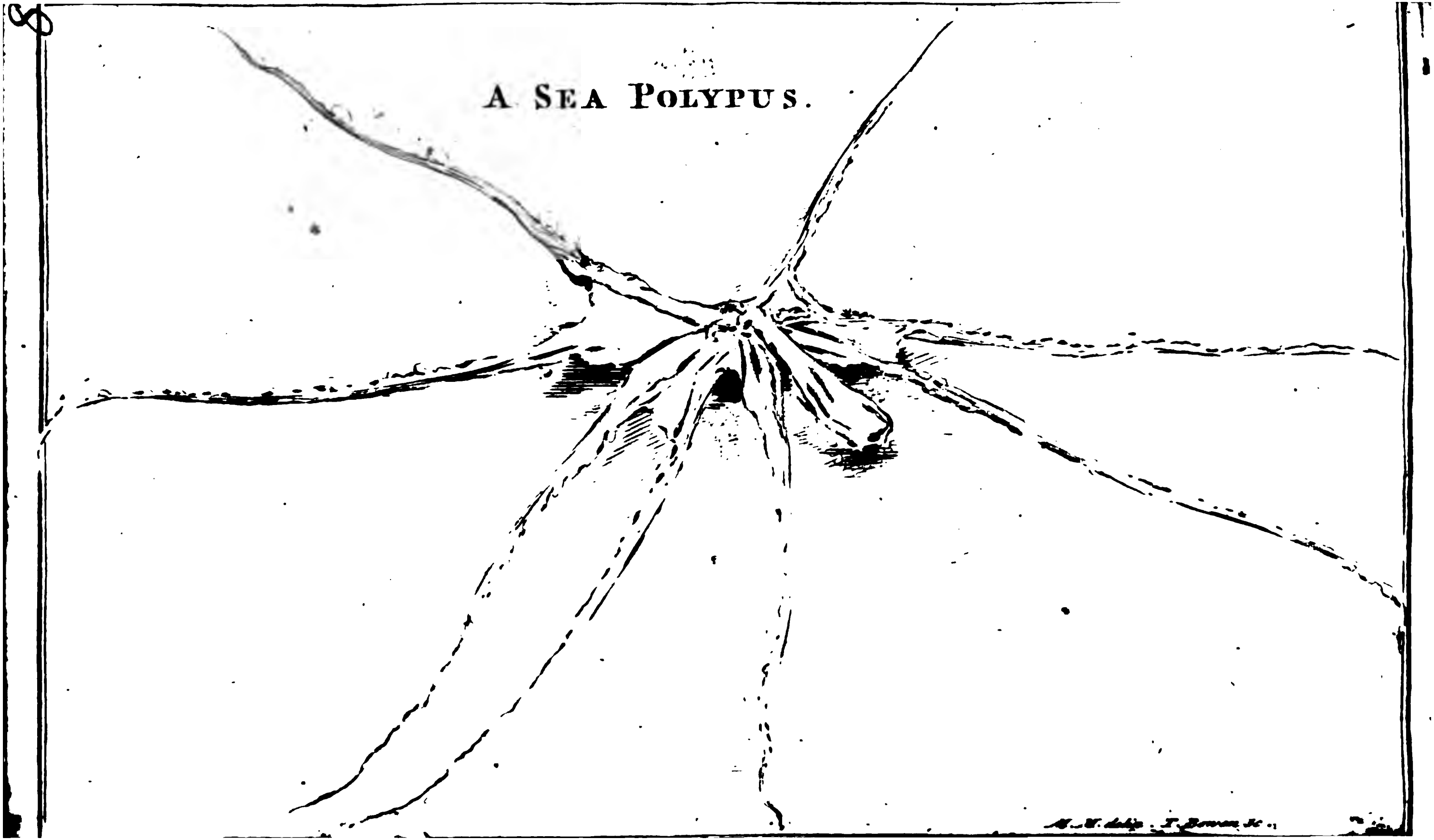


A SEA POLYPUS.

M. W. delin. T. Bowen sc.

here paſs by the extraordinary Trade they carry on in their *Pilchard* Fiſhery, which is the next conſiderable Branch of Buſineſs to that of the *Stannary*: In ſuch prodigious Shoals do the *Pilchards* often times apply to the *Corniſh* Coaſt, on the ſouthern Parts, that the People in the inland, mountainous Parts, make it their Buſineſs, from thence, to obſerve their Arrival, at proper Seaſons of the Year; by which Means, the Gentlemen, concerned in that Fiſhery, are prepared to take them in their Seans, or large Nets, which extend ſome Thouſands of Feet in Length, and take in a large Circumference of the Sea; and we were credibly informed, by one of thoſe Gentlemen, that the Sean has been large enough, and the *Pilchards* ſo numerous, that in one Draught they have taken full 4000 Barrels, each Barrel containing 4000 *Pilchards*, that is, in the whole 16,000,000; nor will this ſeem very ſtrange to any one who has ſpent a Month or two on this Coaſt, during the fiſhing Seaſon. But a ſmall Part of the *Pilchards*, taken here, are conſumed in the County, notwithſtanding they are very delicious eating: The greateſt Part are ſalted, and placed together in large Heaps, where they lie for ſeveral Days under a gentle Preſſure of large Stone-weights, by which Means the Salt and Oil are drained from them in large Quantities, into proper Veſſels; then they pickle, and preſs them into Barrels, and ſend them to *France*, *Portugal*, *Spain*, and other catholic Countries. This *Pilchard-fiſhery* has been always very conſiderable in this County: Hence we find one *Michael*, a *Corniſh* Poet, writing againſt the Poet-Laureat of *Henry* III. (who had defamed his Country) has two or three Lines to the following Effect:

'Twere needleſs to recount their num'rous Store,
Vaſt Wealth, and large Proviſion for the Poor:
In Fiſh *and* Tin *they know no rival Shore.*

We muſt not omit to obſerve, that on this South Coaſt of *Cornwall*, there are found large Quantities of thoſe ſmall Shell-fiſh which afford that excellent Tint, called the *Tyrian Dye*; this Matter is contained in a ſmall *Cyſtus*, or Bag, which looks like a Part of the Inteſtines; it is but in a ſmall Quantity, and looks, when taken out with the Head of a Pin, of a greeniſh-yellow Colour: If this be ſpread upon a Piece of fine Linnen, it will, in a Day or two, begin to appear of a pale rediſh Colour; th Linnen, being waſhed the firſt Time, is heightened into a paliſ Purple; every Waſhing, after, renders the Colour ſtill more intenſly ſtrong and vivid, and which, we obſerved by Experiment was not in the leaſt ſubject to fade or decay.

Upon the Rocks, in many Parts of the Coaſt, we obſerve great Numbers of thoſe Animals which are reckoned of the *Polypus* Kind; they adhere firmly to the Rock on a broad Baſe, an have a Power of unfolding, or contracting the upper Parts a Pleaſure: when they are expanded, they reſemble very much full-blown *Anemony*, conſiſting of a great Number of intern Parts, like the Leaves of that Flower, which plainly appear t have an animal Motion, and, upon the ſlighteſt Touch, will b all contracted within, and covered with the external Pouch, o Caſe, which is of a thick Subſtance.

We can't here paſs by that very curious Sort of *Bivalve Fiſh*, called the *Pholas*, or which we choſe to call the *Piſcis-terebrans*, from its wonderful Faculty of *boring* its Way into the Stones of the rocky Part of the *Corniſh* Coaſt every where. The lateſt Accounts of this very extraordinary Fiſh are very imperfect, as we know by Experience.——This Creature is deſtined to a ſolitary Life, as it lives, altogether in the Hole it makes itſelf in the Stone, and that from its *Infancy* to its laſt Moment; for the Hole, by which it enters the Stone, at firſt, is very ſmall, not exceeding the tenth Part of an Inch in ſome; but from this ſmall Bulk it keeps boring its Way through the Stone, 'till, at laſt, we find it entered 18 Inches, or two Feet, from the Surface, and the Fiſh grown to be three or four Inches long, and more than an Inch thick. It is found alſo, that the Hole is at all Times juſt the Bigneſs of the Fiſh; and muſt therefore be the *Fruſtrum* of a Cone. The Shell ſeems to be the Inſtrument by which it excavates the Stone; for the Fore-part of it, on each Side, is beſet with ſharp-edged Protuberances, like thoſe of a Raſp, and fitted to cut away the Stone; and this is ſtill the more probable, as the Figure of the Hole is exactly always the ſame with that of the Shell, and the Hole is ſo nearly the Size of the Shell, that there is but very little Room for it to open, as it muſt do to a ſmall Diſtance, ſince on the Hinder-part this Fiſh projects a fleſhy Subſtance of a round Form, and two Inches long, when full grown.

This Part ſeems deſtined to take in the Salt Water, and throw it out again, but for what End is not very evident. It has been called the *Proboſcis* of the Fiſh, but improperly, as it is the poſterior Part. It is very remarkable, that though great Numbers of theſe Fiſh enter the ſame Stone, and go on, as it were, in Company, in their reſpective *Antra*, or Apartments, yet are they never found to infringe upon each other, though the Partitions between their Cells are ſometimes ſo thin, that you may almoſt ſee thro' them.

In large and deep Holes of the rocky Cliffs, in ſome Parts of the *Corniſh* Shore, Swallows have been found in the Mid'ſt of Winter, and dragged out, tho' theſe Holes are below High-Water Mark. This we were aſſured of, by People of great Veracity at *Falmouth*; and the ſame Thing is obſerved by *Richard Carew*, Eſq; who wrote near 200 Years ago; theſe are his Words, " In the Weſt Part of *Cornwall*, during the Winter " Seaſon, Swallows are found ſitting in old deepe Tynne- " workes, and Holes of the Sea-Cliffes." He alſo mentions the well-known Account which *Olaus Magnus* gives of the Swallows being found in Winter-time, under Water, among the Reeds, in the Lakes of *Norway*, *&c.* congealed (as it were) in Cluſters, which reſolve, and the frozen Swallows revive by the Warmth of a gentle Fire.

Upon the Whole, we may conclude, that it was not without Reaſon, that CORNWALL, (which formerly included *Devonſhire)* was reckoned a KINGDOM; for we have ſeen a Hiſtory of *Great Britain*, in which the Author, in the Title Page, tells us, that he propoſes to treat diſtinctly of the *four Kingdoms* of *Great Britain*, *viz.* the *Kingdom of Scotland*, the *Kingdom of England*, the *Kingdom of Wales*, and the *Kingdom of Cornwall*; all diverſe from each other, in reſpect of their *Origin*, *Manners*, *Laws*, and *Languages.*

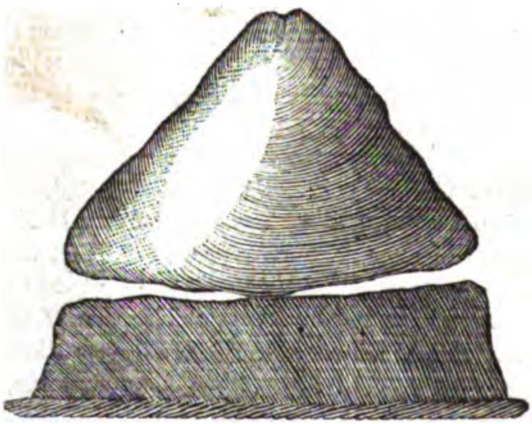
In the following Lines, the Poet has well deſcribed the Bleſſing which Providence has indulged to our Iſland in general, of which no County enjoys a larger Share than *Cornwall.*

Nor Cold, nor Heat's Extremes, thy People fear,
But gentle Seaſons turn the peaceful Year.

When teeming Nature's careful Hand beſtow'd
Her various Favours on her num'rous Brood,
For thee th' indulgent Mother kept the beſt,
Smil'd in thy Face, and thus her Daughter bleſt:
In thee, my darling Iſle, ſhall never ceaſe
The conſtant Joys of Happineſs and Peace;
Whate'er can furniſh Luxury, or Uſe,
Thy Sea ſhall bring thee, or thy Land produce.

ADDENDA.

WE have thought it neceſſary to illuſtrate what is ſaid of the famous *Logan-ſtone* at *Caſtle-Treryn* (Page 6.) by a Repreſentation of the Form of the Stone, and the Manner in which it reſts upon the Surface of the other, below it, in an inclined Poſition, by a perpendicular Section of both thro' the Point of Contact.



The *Engliſh Sea-peaſe*, *Pill-Corn*, or naked Oats, and ſome other Plants (mentioned Pag. 8.) we neither ſaw, nor heard of in the Country, but have added them on the Authority of Mr. *Ray*.

It has been inſinuated, that the *Sea-Polypus* (in Pag. 14.) is very common on the *Sea-coaſt*, and already deſcribed by *Aldrovandus* and *Rondeletius*; to which we anſwer, that we have ſeen and examined a great Part of the *Engliſh* Coaſt, and have never ſeen, or heard of any ſuch Thing. As to the above-mentioned Authors, ſuch as have an Opportunity may conſult them, by which they may be ſatisfied whether any Animal in their Plates can be found to anſwer all the Characters of this. We may farther add, that in ſeveral *Muſeums* which we have examined, both abroad and at home, we have never ſeen an Animal, in every Part, like this, and, to the beſt of our Remembrance, in ſcarcely any Reſemblance to it.

The *Pyrocorax*, or *Corniſh Chough* (Page 16.) has red Legs and Beaks, and is nearly the Size of a *Jack-Daw*; they have the Character of a *thieviſh Bird*, as they will carry away from a Perſon's Houſe whatever they can find to ſuit their Humour; even Coals, or any thing on Fire, they will carry away, and thereby endanger the Houſes, which are generally thatched in theſe Parts; hence, they become very obnoxious to the Neighbourhood where they much abound.

The *Iſlands of Scilly*, by the moſt ancient *Greek* Hiſtorians, are called the *Caſſiterides*, from the *Greek* Word κασσίτερος, *Tin*; whereby it is ſhewn, that theſe Iſlands were famous in the higheſt Antiquity, for their *Tin-Mines*; and there are many Accounts of the *Phænecians*, and other foreign Nations, frequenting them on that Score, and carrying on a great Trade in Tin, in the earlieſt Ages of the World.

THE
NATURAL HISTORY
OF
DEVONSHIRE.

THIS County, as well as that of *Cornwall* (of which we have ſpoken ſufficiently already) is another Portion of that Part of *Britain*, which, in the Time of the *Romans*, was call'd *Dunmonium*. It has ſince, however, received divers other Appellations. It was called *Dunan* by the *Corniſh Britons*, and *Duffneynt* by the *Welch Britons*, that Term ſignifying, in their Language, *deep Valleys*, or *Bottoms*; becauſe their Habitations, for the moſt part, are erected in thoſe low Places: At preſent, however, it bears the Name of *Denſhire*, or *Devonſhire*, from the Induſtry of the Huſbandmen, who conſtantly practiſe the Art of *Denſhiring*, that is to ſay, of paring and burning the Surface of their Lands, in order to improve them, and render them more fertile.

This County, which lies between Latitude, 50° 66′ and 51° 15′, and between 3° 0′, and 4° 40′, Weſt Longitude, from *London*, is above 200 Miles in Circumference, 64 in Breadth, and 70 in Length, is bounded on the North by the *Severn-ſea*, or *Briſtol* Channel, on the Eaſt by *Somerſetſhire*, on the South by the *Engliſh* Channel, and on the Weſt by *Cornwall*.

It is ſituate in the Dioceſe of *Exeter*, and contains about 1,900,000 Acres, and has more Rivers belonging to it than any other County throughout the Kingdom of *Great-Britain*.

The Air of this County is very mild and healthful in their Vales, or Bottoms; but exceſſively cold and bleak upon their Hills.

The Soil thereof is various; for, the lower Grounds are naturally fruitful, yet, made much more ſo, by the Art and

Induſtry of thoſe who are poſſeſſed of Lands there; the Hills, however, are very barren.

In the eaſtern Parts of this County, there is Plenty, not only of good Corn, but fine Paſturage for Sheep, where the Grounds are dry and chalky; yet, their Sheep, ſeldom, if ever, thrive on their marſhy Grounds.

The ſouthern Part of this County is remarkably fruitful, and as juſtly called the *Garden* of *Devonſhire*, as *Italy* is univerſally allowed to be the *Garden* of the *World*.

The Trees are of as great Variety in this Part of the County, as in any other Places of the Kingdom, and Fruit-Trees are very plentiful, eſpecially Apples, with which they make ſuch large Quantities of Cyder, that a great Number of the Copy-hold Tenants, pay their Rents with the Profits ariſing from that Commodity only. The Merchants, who go great Voyages at Sea, find it a very ſerviceable Drink in their Ships, and for that Reaſon, lay in vaſt Stores of it; for, one Ton of Cyder, will go as far, if not farther, than three of Beer, and at the ſame Time, is found by Experience, to be much more wholeſome for their Ship's Crew, eſpecially in hot Climates.

It is reported, by ſome, tho' we cannot aſſert it to be real Fact, that there have been exported from this County to *London*, no leſs than ten thouſand Hogſheads of this Liquor, one Year with another: Which Way it has been diſpoſed of, is not eaſily to be accounted for.——However, as very little or none of this Commodity can be procured neat, in any Part of that Metropolis, it is a common, and very natural Conjecture, that it being of a more vigorous and high Spirit than the *Hereford* Cyder itſelf, it has been made uſe of privately and artfully by the Vintners there, with ſuch other Ingredients as may be deemed proper for that Purpoſe, to brew a Sort of Claret, which will paſs well enough with a Set of *Bacchanalians*, who have little or no Judgment, and have more Regard to the Quantity than the Quality of what they drink in perfect Profuſion. Neither is it in the leaſt impoſſible, but rather highly probable, that the beſt Sort of it, which is made at *Southam*, and the Parts adjacent, being kept long and judiciouſly managed and mixed, may paſs better, and more un-

unſuſpected for White-wine, it having as good at leaſt; if not a better Body, than real White-wine generally has.

Tho' this County (as we have before obſerved) abounds with a greater Variety of Rivers, than any other County can boaſt of; yet, there are but two, *viz.* the *Tamar* and the *Ex*, that are peculiarly worthy of the Reader's Attention.

The former, which ſeparates, or divides this County from *Cornwall*, takes its Riſe in the Hills, near *Welcomb*, and runs into the *Engliſh* Channel at *Plymouth*, by a Courſe, nearly from North to South.

This River is peculiarly remarkable, not only for the Numbers, but, the Goodneſs of the *Salmon* that are caught therein.

The *Ex* forms a Courſe upon the ſame Points, from the Heart of the County, and paſſing by *Exeter*, falls into the ſame Sea. Great Plenty of Salmon is alſo found in this River, where they come in very great Quantities in the ſpawning Seaſon.

From theſe two Rivers, the Country are ſtocked with a great Variety of common Fiſh, of all Denominations; but, the moſt beneficial, both at home and abroad, are the *Herring* and the *Pilchard:* For, by Traffick with them, all Sorts of Commodities are brought in from the adjacent Counties, and foreign Nations.

In divers Places, in this County, *viz.* at *Cleave*, *Taviſtock*, *Lamerton* and *Liſton*, there are ſeveral chalybeate mineral Waters found, that have been of ſingular Service, in the Removal of divers dangerous, and epidemic Diſtempers.

Near *Brixham* upon *Torbay*, there is a remarkable *Well*, called *Lay-well*, of which, we ſhall here inſert Dr. *William Oliver's* Account, as he was on the Spot to obſerve it.

An Account of LAY-WELL, *by Dr.* WILLIAM OLIVER, *extracted from the Abridgment of the Philoſophical Tranſactions, by* M. LOWTHORP, Vol. II. Page 305.

“ *Lay-well*, near *Torbay*, is about ſix Foot long, and five Foot broad, and near ſix Inches deep, which *ebbs* and *flows*, very often every Hour, viſibly enough. I am informed, 'tis moſt conſtant *Winter* and *Summer*; tho' I am apt to think, it moves faſter in *Winter*, when the Well is fuller than in *Summer*: Becauſe when I obſerved it firſt (in *July* 1693) I think it *flowed* ſomething quicker than I found it did on my ſecond Obſervation, toward the End of *Auguſt* following; for the Water was then conſiderably ſhrunk in the Well notwithſtanding we had for about a Fortnight much Rain: And tho' when once it began to *flow*, it performed its *Flux* and *Reflux* in a little more than a *Minute's* Time; yet I obſerved it would ſtand at its loweſt *Ebb* ſometimes two or three Minutes; ſo that it *ebbed and flowed*, by my Watch, about 16 Times in an Hour, and ſometimes I have been told 20. ——— As ſoon as the Water in the Well began to *riſe*, I ſaw a great many *Bubbles* aſcend from the Bottom; but when the Water began to *fall*, the *Bubbling* immediately ceaſed. I meaſured its *High* and *Low-Water-marks*, and found them between five and ſix Inches diſtant; not of perpendicular Depth, but as it ſpread itſelf on a broad Stone, as the Sea does on a Beach or Shore. Tho' I am apt to think its perpendicular Height would be as much, or more in that Time, were its Out-let dammed up to try an Experiment: For as it riſes, it runs with a ſmall Stream, which is greater or leſs, according as the Water in the Well *riſes* and *falls*.

That it has any Communication with the Sea is not manifeſt, nor is the Water *brackiſh* at all. The whole Country adjacent is very hilly all along the Coaſt, inſomuch that from *Brixam* to the Top of the Hill is about a *Mile* and *half*; and the Well is about half Way up the Hill (which hereabout is ſomewhat uneven and interrupted) and comes out at a ſmall Deſcent, yet conſiderably *higher* than the *Surface* of the *Sea*.

I tried it with an *Oaken-leaf*, as ſoon as I ſaw it the firſt Time, but could not find it *change colour*. I drank of it; 'tis very *ſoft* and pleaſant; has no Manner of *Roughneſs* in it, and ſerves for all Manner of Uſes to the Country People in their Houſes; they alſo uſe it in *Fevers* as their ordinary *diet-drink*, which ſucceeds mighty well."

To this Account of the Doctor's, we ſhall ſubjoin a few Remarks of our own, as being in the Place two Days, in the Year 1751. —— The Form of the Well now is not ſquare but nearly round, and being raiſed above the Ground with Stones, the

Waters now ſtand higher, and there is about an Inch and half Difference in the Perpendicular; when we obſerved it there was no Irregularity in the Time of its ebbing and flowing; for both together conſtantly happened in ſix Minute's Time, or ten Times in an Hour, as we obſerved by a Watch for many Hours together, and this not only of the Waters in the Well, but more exactly in Holes which we cauſed to be dug in the Road by the Side of the Well; for theſe Holes were conſtantly filled and emptied by Turns, and it was very pleaſant to ſee the Water at firſt ruſh in through ſeveral ſmall Paſſages 'till the Hole was filled, which little Flood would continue near three Minutes, then it would begin to ebb, and ſo continue for ſomething more than three Minutes, 'till the Hole was dry, and we could ſee the Water run away through all the little Ducts; in a very ſhort Time it returned again, and ſo on continually, without any Variation that we could obſerve, and this was the Caſe in all Parts of the Ground about the Well, as far as we made the Experiment: On this Account, thoſe little reciprocating Ponds, or Springs, became the common Subject of Play or Paſtime to the Children of the Neighbourhood. We formed a Deſign of ſtopping up the Out-lets, in order to ſee how high the Water would riſe in the Well, and accordingly employed a Man two Hours about it, but to no Purpoſe, there being ſo many ſubterraneous Paſſages by which it goes out. The Waters of this Well ſupplies a Stream of about five Feet wide, and what is very remarkable, the Waters of the whole Stream ebbed and flowed with the Well about half an Inch, as was always ſeen by the Stones in the Brook. It was ſomething odd to ſuppoſe the Waters of this Well ſhould come from the Sea, ſince it is very manifeſt it does not, as it is at a very conſiderable Height above the Level of the Sea, the Grounds juſt above it, on the contrary Side, riſing very high; and from Waters gathered in the ſubterraneous Baſons in this Hill, proceeds this wonderful reciprocating Fountain, the particular Manner in which this may be effected we ſhall hereafter explain in our Treatiſe on *Hydraulics*.

Having expatiated farther than at firſt was intended on this one particular Production of Nature, we ſhall proceed to give a more curſory Account of the various Curioſities which are to be met with in Abundance on the ſeveral Coaſts of this County. To avoid Prolixity, however, we ſhall take notice of ſuch only as are more remarkable than ordinary, and well-worthy of the Attention of the inquiſitive Reader.

In the firſt Place, then, 'tis very obſervable, that tho' *Torbay* is but a little, petty Village, about 12 Miles North of *Dartmouth*; yet its Bay, which lies in the *Britiſh* Channel, and is about 12 Miles in Compaſs, is one of the fineſt Roads for Ships, that all *England* can boaſt of: And as an indiſputable Proof of its great Importance, it will not be improper to obſerve, that this Bay was the general Station of our Fleets during the whole Time that King *William*'s War was carried on with *France*. And here it was, that his ſaid Majeſty, when Prince of *Orange* only, was landed by Admiral *Herbert*, on the 5th of *November* in the memorable Year 1688, from the Fleet which brought him from *Holland* under that Admiral's Command, whom afterwards he conſtituted Earl of *Torrington*, as a grateful Acknowledgment of his faithful Services at that critical Conjuncture; and as the happy Conſequences that attended that Expedition are ſo univerſally known, it would be altogether needleſs, if not impertinent, to enlarge upon them. It muſt be confeſſed, however, that tho' that Road be ſo highly valuable in itſelf, and ſo juſtly admired, yet ſtill there is one Inconvenience that attends it; for a South, or South-Eaſt Wind will too frequently oblige our Ships to put out from thence to Sea, or at leaſt to run into *Dartmouth*.

Another great Curioſity in Nature, tho' 50 Miles in the Sea, off the North-Weſt Coaſt of *Devonſhire* is *Lundy-iſland*, which is five Miles long, and two broad; but is ſo encompaſſed with inacceſſible Rocks, that it has but one Entrance into it, and that likewiſe ſo remarkably narrow, that two Men can ſcarce go abreaſt. The South Part of this Iſland, indeed, is indifferently good Soil, and ſuch as is not to be complained of; but then the North Part of it is not only, in a great Meaſure, barren, but has a high pyramidical Rock, called the *Conſtable*, which is the juſt Object of any curious Spectator's Admiration.

Tho' the Inhabitants, it muſt be allowed, ſtand in no Want of Horſes, Kine, Hogs, Goats, Sheep, or Rabbets; yet their principal Commodity is Fowl, which they enjoy in ſuch a Profuſion, that their Eggs lie thick upon the Ground at their Seaſon of Breeding. To this we ſhall only add an Obſervation or two, which we imagine, ſomewhat extraordinary, and highly worthy of Notice; for, in the firſt Place, we are informed, that notwithſtanding the Iſland lies ſo far in the Sea, as has been already mentioned; yet it has divers Springs of fine freſh Water: And again, the Inhabitants inſiſt, whether it be real Fact or not we cannot determine, that no venemous Creature of what Nature or Species ſoever will live amongſt them.

On the Coaſt of this Country, there is found in plenty likewiſe a peculiar rich Sand, which proves of ſingular Service to ſuch Huſbandmen as live at ſome conſiderable Diſtance from the Shore, and can afford to purchaſe it for the Improvement of their poor and lean Lands; for the remoter their Reſidence is from the Sea-ſide, the Commodity advances proportionably in Price. The Quality of this Sand is of ſo extraordinary a Nature, that it renders the moſt barren Land fruitful, and, as it were, impregnates the Glebe. The curious and inquiſitive Reader, if he be inclined to pry farther into the innate Virtues of this remarkable Sand, may be better informed by conſulting the Philoſophical Tranſactions, N°· 103, which, for Brevity's ſake, we chuſe rather to refer to, than tranſcribe.

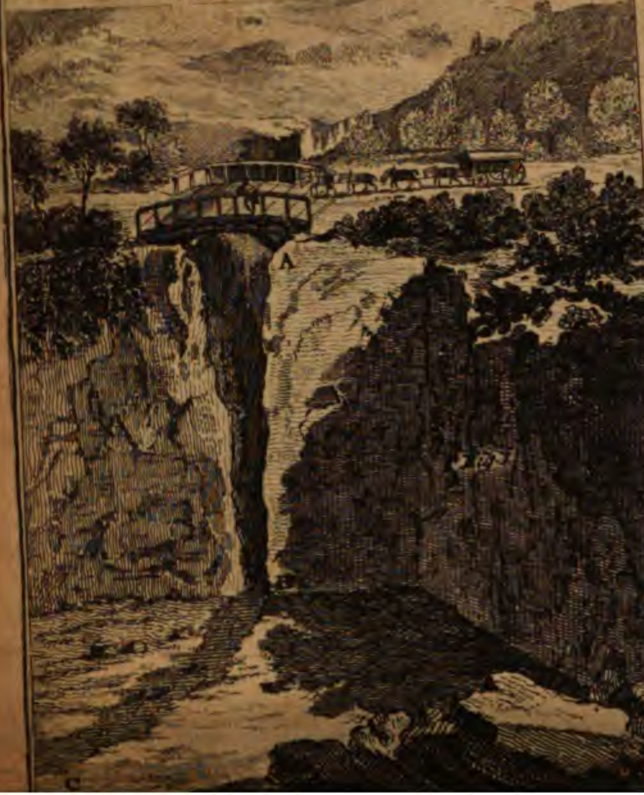
Thoſe Huſband-men, however, who live at too great a Diſtance from the Sea-Shore, and whoſe Circumſtances are too narrow to purchaſe a ſufficient Quantity of that valuable Manure, are reduced to the Neceſſity of uſing Marle, Lime, and the Turf of the Ground, ſkinned off, and burnt to Aſhes; which Method of Agriculture, is very agreeable to the Rule preſcribed by *Virgil*, in his firſt *Georgic*.

Sæpe etiam ſteriles, &c.

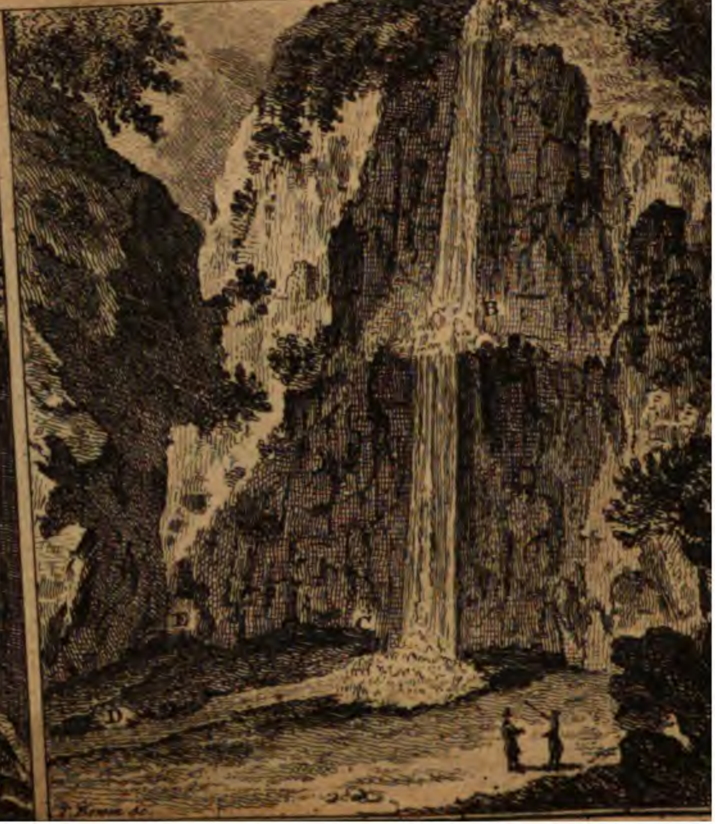
Long Practice has a ſure Improvement found,
With kindled Fires to burn the barren Ground;
When the light Stubble to the Flames reſign'd,
Is driv'n along, and crackles in the Wind.
Whether from hence the hollow Womb of Earth,
Is warm'd with ſecret Strength for better Birth;
Or, when the latent Vice is cur'd by Fire,
Redundant Humours thro' the Pores expire;

9.

A VIEW of the River LID.



A VIEW of LIDFORD CATARACT.



Or, that the Warmth diſtends the Chinks, and makes
New Breathings, whence new Nouriſhment ſhe takes;
Or, that the Heat the gaping Ground conſtrains,
New knits the Surface, and new ſtrings the Veins;
Leſt ſoaking Showr's ſhould pierce her ſecret Seat,
Or freezing Boreas *chill her genial Heat;*
Or ſcorching Suns too violently beat.

DRYDEN.

The River *Tamar*, before mentioned, receives into it a little River called *Lid*, (on which ſtands the Town called formerly *Lidſtone*, but now *Lidford)* which is peculiarly remarkable for its being pent up with Rocks at the Bridge there, and for making itſelf ſo deep a Fall into the Ground by inceſſant Working, that the Water is ſcarcely to be ſeen, or the Murmurs of it to be heard, to the no ſmall Aſtoniſhment of all Strangers who have Curioſity enough in them to liſten to ſo uncommon an Occurrence.

The Bridge here is nearly level with the Road, and the Water running nearly 70 Feet below, makes it ſo great a Curioſity, that we judge it worthy of a Repreſentation, as in Figure I of the annexed Plate; where the Rock is ſuppoſed to be cut through perpendicularly from the Bridge to the Water, and taken away to ſhew the very deep *Canal*, A B and the Rivulet of Water B C, but juſt viſible to a Spectator on the Bridge above.

Within a Mile of this Place, is another Phænomenon, ſtill more remarkable, *viz.* a Cataract, or Fall of Water from the Height, as we are informed, of more than an hundred Feet; though we had not the Opportunity of meaſuring it; nor could we take a Draught of the Place, and Caſcade ſo correct as could be wiſhed; but yet ſome tolerable Notion may be formed of it, from a rude Sketch in Fig. II.

The Water comes from a Mill at ſome Diſtance, and after a Courſe upon a Deſcent of near an hundred Feet from the Level of the Mill, it arrives to the Brink of the Precipice, or ſteep Rock at A, from whence it projects in a beautiful Manner, and ſtriking upon a Part of the Clift ſtanding out at B, by which it is ſomewhat divided, it falls from thence in a wider Cataract to the Bottom; where ſtriking the Earth with ſuch great Violence as muſt be acquired in ſuch a prodigious Fall, it makes a deep and foaming Baſon in the Ground at C, from whence it goes in a Stream, D, to the River *Lid*, coming from between the Hills at E.

This wonderful Fall of Water fills the Air all around at the Bottom with ſuch an Atmoſphere of aqueous Particles, that a Perſon finds himſelf in a Miſt, as it were, in his Approach; and the Air is put into ſuch violent Agitations, that you can ſcarcely bear to come, or ſtand near the Place. It is reported, that Travellers, who have ſeen this Cataract, have allow'd it to equal at leaſt, if not exceed any one they ever met with Abroad; and therefore, it is much to be wondered at, that ſo very great a Curioſity, and Subject of Natural Hiſtory, ſhould have been paſs'd over in Silence, in every Addition of *Cambden*, and even in *Magna Britannia* itſelf.

In the Pariſh of *Beare-Ferris*, there were Silver Mines diſcovered in the Reign of King *Henry the Fourth*, but they have long ſince been diſcontinued.

Near *Plymouth*, there is a remarkable Rock, now called the *Haw*, a Hill between the Town and the Sea, on the Top whereof, which is a remarkable fine Plain, there is a moſt delightful Proſpect on all Sides, and a curious Compaſs for the Service of Sailors.

We were credibly informed by a Gentleman at *Plymouth*, that in a ſmall Iſland in that Harbour, there is found, in the cavernous Parts, conſiderable Quantities of that wonderful Foſſil, called, *Iſeland Cryſtal*, remarkable for its ſingular Property of a *double Refraction* of *Light*.

Not far from *Plymouth*, juſt mentioned, is the *Eddy-ſtone*, a very dangerous Rock to Sailors; but of late Years rendered of very great Uſe, by Means of a ſtately Light-Houſe built upon it. At the Mouth of the River *Avon*, ſtands St. *Michael's* Rock, which is ſeveral Acres in Circumference. *Dart-moor*, ſo called from the River *Dart*, which it gives Riſe to, makes the Midland Part of the Weſtern Side of this Country; it is very high and mountainous; but in the lower Parts very ſwampy and mooriſh; in other Parts very rocky, and full of Stones; in Winter Time, the Roads over it are very difficult to find, and dangerous to paſs: It affords great Quantities of *Moor-ſtone*, and ſome *Load-ſtones*, but of an inferior Sort.

Near South *Moulton*, is a Quarry of Stone, of ſo fine a Grain, and ſo hard at the ſame Time, that they make perhaps the beſt *Whet-ſtones* in the Kingdom for the finer Sort of Edge-tools, ſuch as *Joiners* and *Cabinet-makers*, &c. uſe; and indeed great Quantities are made and ſold for that Purpoſe, to *London*, and other Places.

In the Foreſt of *Dart-moor*, (firſt made one by King *John*) there were formerly many valuable Tin-works. This Foreſt is very extenſive, being no leſs than twenty Miles in Length, and fourteen in Breadth. Every Summer it yields Paſture for near One hundred thouſand Sheep, beſides a proportional Number of other Cattle. It ſupplies likewiſe the North, Weſt, and South, with a great Variety of little pleaſant Rivers.

On that Part of the North Coaſt, called the *Burrows*, near *Biddeford*, are the greateſt Quantity of the largeſt and moſt beautiful Pebbles that are any where to be ſeen. Indeed, they are ſo regularly veined, and variegated with Colours, that it ſeems, as it were, the Work of Art. The Bank of Pebbles is near three Miles long, very deep and wide; they are ſmooth as Marble, of an oblong Form, and in general, from 6 to 16 or 20 Inches in Diameter the ſhorteſt Way, and 2 Feet the other, of the largeſt Sort.

Six Miles from *Biſhop's Teignton*, the River *Iſca*, called by the *Britiſh*, *Iſc*, and the *Saxons*, *Ex*, flows by *Exeter* and *Topſham* with a large Stream into the Ocean at *Exmouth*. As to the Etimology of the ſeveral Names, there are ſeveral Conjectures, but all very uncertain, and not to be relied on. The Head of it lies in a fowl, barren Ground, and riſes after a very uncommon Manner. Some of the Hills in the Parts adjacent to *Dart-moor*, before-mentioned, are very high; and on the Top of one of the higheſt there is a Plain, almoſt of a circular Form, near a Mile in Diameter, which is full of little Springs; and there being no Declivity, nor commodious Paſſage for the Waters, they frequently ſwell upon the Surface of the Earth. The Perpetuity of which Waters, (without any Regard to the Seaſons of the Year, or the Weather) has given occaſion for ſome People to ſurmiſe, that they were not derived in the ordinary Way, from condenſed Snow, Clouds, Rain, Miſts, Dews, *&c.* but by ſome Under-current. Now, as this is manifeſtly contrary to all true Reaſoning, and Nothing of the like Kind is to be found in any other Place, it is not likely to be the Caſe here, but muſt be a Miſtake, ariſing from the Inaccuracy of the Obſervations that are made upon it.

In the Weſtern Parts of *Devon*, we find the greateſt Quantity of Game; eſpecially Hares, Pheaſants, and Woodcocks, in ſo great Abundance, as to render them very cheap in theſe Parts. And we were aſſured by ſome Gentlemen at *Taviſtock*, that there is in this Part of the Country, a Bird ſo very ſmall, that it is reputed a *Humming Bird*, and like that, hangs its Neſt by a Thread from the extreme Bough of a Tree.

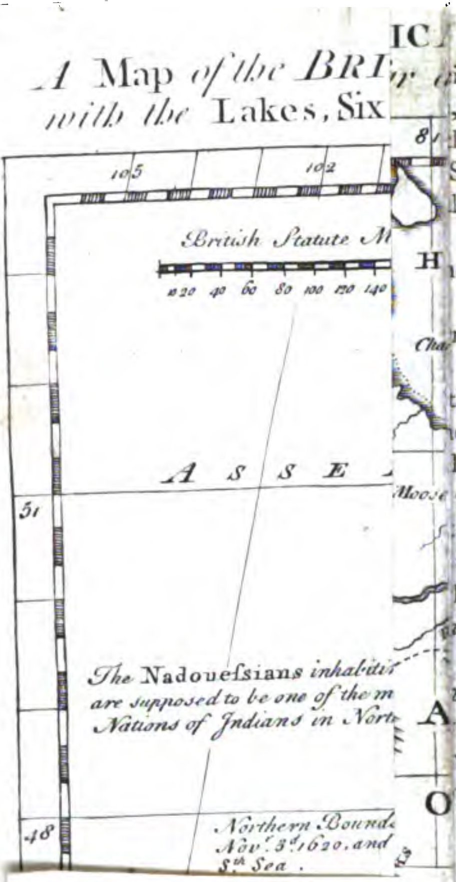
In the South-weſt Parts of *Devonſhire*, we find a great Quantity of Marble; yea, in many Places diſcover Marble Rocks as the Baſis of the Road we travel on; and this Marble, when poliſhed, is little inferior to ſome we have from Abroad; and accordingly, is much uſed by the Gentry in thoſe Parts.

The River *Ottery*, in this County, is peculiarly remarkable for its *Otters*, or *Water-Dogs*, with which amphibious Animals its Waters abound.

At *North-Taunton*, there is a Pit of large Circumference, Ten Feet deep, out of which ſprings up a little *Brook*, or *Bourne*, which continues for ſeveral Days. Such of the Inhabitants as are ſuperſtitiouſly inclined, imagine, that this *Bourne* is the Fore-runner of ſome public and fatal Diſaſter. 'Tis very obſervable, likewiſe, that the River *Taw*, which riſes in the very Heart of this Country, upon a Spring Tide, at every New and Full Moon, overflows the Meadows at *Barnſtaple*, to that Degree, that the Town itſelf ſeems a Peninſula.

Not far from *Comb-Martin*, or *Martin*'s *Comb*, ſo called, for its low Situation, or lying in a Vale, (as the *Britiſh* Term *Kum*, from whence it has its Derivation, ſignifies) there is a *Cove* for the landing of Boats; and, the Lands lying round about it, are noted for yielding the beſt Hemp, and that in a greater Abundance than in any other Part of the County.

Tho' the Hills that are adjacent to *Comb-Martin*, before-mentioned, are incapable, 'tis true, of being cultivated, (as the Vales or Bottoms are) on account of their being not only rocky, but



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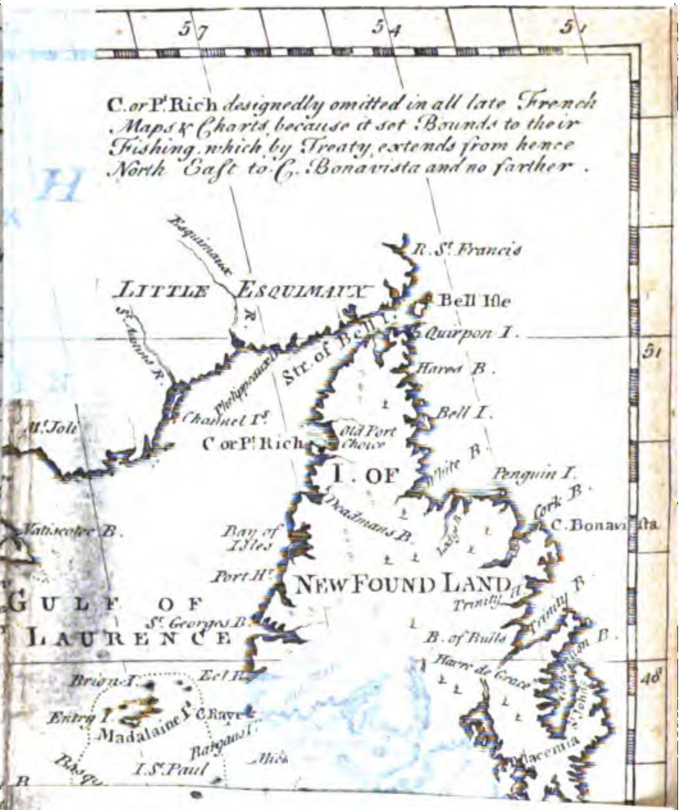

but very ſteep; yet on the other Hand, they have their peculiar Advantages, which equal at leaſt, if not by far ſurpaſs, the Profits ariſing from the Induſtry of the Farmer in any other Parts; for they are impregnated not only with rich Mines of Silver, but with Tin, Lead, Iron, and Copper, with ſome ſmall Mixture of Gold and Diamonds.

As to their Silver Mines, tho' they are at this Juncture, indeed, but too little regarded; yet, 'tis evident, that, in former Times, they proved very advantageous to the Crown of *England*; for we find, not only ſeveral Grants made by King *Edward* III. and other Kings, for carrying them on with the Reſervation of the Tenths to the Church, but from the Records of the Exchequer, it appears what immenſe Sums have been raiſed from the working them; for in the Year 1293, one *William de Wymondham* was Over-ſeer of thoſe Works, and by his Art and Induſtry there were then refined out of the Lead-Ore no leſs than 370 Pound Weight of fine Silver, which King *Edward* I. gave for a Portion with his Daughter *Eleanor* to the Count de *Barre*.

There were refined likewiſe the very next Year 521 Pounds Weight of Silver, which was ſent to *London*, in order to be coined there; and in the Year then next enſuing, in which the *Derbyſhire* Miners were ſent to aid and aſſiſt the above-named *William de Wymondham*, he ſent 700 Pounds Weight of Silver more to the Mint for the ſame Purpoſe.

More Mines, after that, were diſcovered, and proper Artificers ſent for again out of the *Peak* of *Derby* and *Wales*, but what Advantages accrued from them we are at a Loſs to determine.

In Queen *Elizabeth*'s Reign, the Mines were again entered upon, by one Sir *Beavis Bulmer*, a curious Artiſt in the refining Way, who got great Quantities of Silver from them, whereof he ordered two Cups, very rich and capacious, to be made, and preſented one of them to *William Bourchies*, then Earl of *Bath*, and the other to *Richard Martin*, then Lord Mayor of *London* with proper Inſcriptions upon them, but too long and tedious to be here recited.

The Weight of the former we have no particular Account of, but the latter, we are told, weighed 137 Ounces.

As to the Tin-mines, there are juſt Grounds to believe, that, in former Ages, this County was very conſiderable on their Account; and as an inconteſtible Proof of its being ſo, there were formerly four Stannaries, or Juriſdictions, and as many Stannary Courts, and Coinage, namely *Plimpton*, *Taviſtock*, *Aſhburton*, and *Chagford*. By theſe were choſen from Time to Time, by the Order and Direction of the then Lord Warden, certain Jurates to meet in a Seſſion of Parliament at *Crokern-Torr*, an high Hill in the Midſt of *Dart-more*.

This Parliament had Power to make Laws, touching the Eſtates of the Mines and Stannaries, a large Volume whereof was printed in the Reign of Queen *Elizabeth*, at that Time, when the Earl of *Bedford* was Lord Warden.

As therefore, thoſe Courts were then ſubſiſting, 'tis evident, beyond all Contradiction, that the Tin-trade was at that Time very conſiderable; for otherwiſe there would have been no Neceſſity for any ſuch Authorities to ſupport it.

Nay, in King *John*'s Time, 'tis very apparent, that *Devonſhire* produced a much larger Quantity of Tin than *Cornwall* itſelf; the Coinage of the former being farmed at 100*l.* annually; whereas what the latter produced was valued at no more than 100 *Marks*. — Now, indeed, it muſt be acknowledged, that *Cornwall* has almoſt the whole Trade; for notwithſtanding there are ſtill ſome Works here, the Advantages ariſing from them are very trivial and inſignificant, unleſs in two or three very lately opened.

Some few Gold Mines have, moreover, been diſcovered in this County; but for Want of Fuel, and ſome other ſubſtantial Reaſons, never have been, nor ever will, we preſume, be brought to Perfection.

To conclude, the original Inhabitants of this County, in antient Times, were repreſented bold, intrepid, prodigal of Life, conſtant in Affection, courteous to Strangers, and extremely fond of popular Applauſe. "The *Danmonii* "(ſays *Diodorus Siculus*) were a civil and courteous Peo-"ple in thoſe barbarous Times, ſtout and puiſſant, taking "Heart even of the Soil itſelf, and emboldened by the Rough-"neſs of their Country; and ſo magnanimous were they, that

“ they were not totally ſubdued by the *Saxons*, ’till the Year “ 465.”

The *Devonians*, even at this Day, do not deviate from the Virtues of their illuſtrious Anceſtors; for they are a bold and hardy People, to the laſt Degree, and uſe their utmoſt Endeavours to maintain their Poſt of Honour and Reputation in the World. Their Conſtitutions are ſtrong; they are quick of Apprehenſion, and eaſily inſtructed in any Employments whether Military or Civil. The lower Claſs are very robuſt, very diligent and induſtrious, and very ready to ſerve their Country either by Sea or Land.

ADDENDA.

A CATALOGUE of PLANTS *which grow in, and near the Pariſh of* Biddeford, *communicated by Mr.* PIKE, *of that Town.*

ADder's Tongue.
Agrimony.
Water Agrimony.
Alder, Black.
Wood Betony.
Water Betony.
Paul's Betony.
Biſhop's Weed.
Birds Foot.
Biſtort.
Briony, White.
———, Black.
Buck-bean.
Bugloſs.
Vipers Bugloſs.
Butchers Broom.
Brook-Lime.
Buck's-Horn-Plantain.
Sweet-Briar.
Bugle.
Clowns-woundwort *or* All-heal.
Calamint.
Calamus Aromaticus
Celandine, Great.
———, Small.
Centaury.
Croſs-wort.
Clary, Wild.
Cinquefoil.
Cranes-Bill.
Dwarf Elder.
Dittander.
Devils-Bit.
Dodder.
Sun-Dew.
Fluellin.
Flax-Weed.
Figwort.
Fox-Glove.
Fumitory.
Crow Garlic.
Gout-wort, *or* Herb Gerard.
Stinking Gladin.
Glaſs-wort.
Golden-Rod.
Ground Ivy.
Gromwell.
Hawke-weed, *of ſeveral Sorts.*
Sea Holly.
Herb-two-pence.
Hounds-tongue.
Herb-Robert.
Horſe-tail.
Horn Poppy.
Harts Tongue.
John's Wort.
Jack by the Edge.
Job's Tears.

James-wort, *or* Rag-wort.
Ladies-bed-ſtraw, *red, white, and yellow,*
Looſe-ſtrife.
Sea Lavender.
Liver-wort.
Aſh-colour Liver-wort.
Cup Moſs.
Mercury.
Mullein.
Fern Moſs.
Milk-wort, *white, red, and blue.*
Madder.
Golden Maiden-hair
White Maiden-hair.
Beſſom Moſs.
Maſter-wort.
Vervain Mallow,
Melilot,
Mouſe-Ear, *ſeveral Sorts.*
Wild Marjoram,
Mug-wort.
Nep, *or* Nimproyal, *or* Cat-mint.
Navel-wort.
Nightſhade,
Orchis.
Oſmund-royal,
Ox-Eye.
Ox-ſlips.
Orrice, *ſtinking.*
Wall-Pepper.
Peter's-wort.
Water-Pepper.
Parſly-piert.
Plowmans-ſpikenard
Polly-pody of the Oak.
Queen of the Meadows,
Rue-le[illegible] Whitlow graſs.
Snake-weed.
Scorpion graſs.
Soap-wort.
Spleen-wort.
Solomon's ſeal.
Sanicle.
Burnets Saxifrage,
Scabius.
Self-heal.
Smallage.
Snail-claver.
Spear-wort.
Tormentil.
Tway-blade.
Wild Thyme.
Valerian.
Vervain.
Winter-green,
Wood-ſorrel,

THE
NATURAL HISTORY
OF
DORSETSHIRE.

AS the Inhabitants of the two laſt mentioned Counties of *Cornwall* and *Devonſhire* were known and diſtinguiſhed by the Appellation or Title of *Danmonii*, in the *Latin* Language; ſo the Natives of this, who lie Eaſtward of them, are ſtiled by *Ptolemy*, in his geographical Tables, Δυροτριγες, and *Durotriges* by the *Romans*. Theſe are the very identical People, whom the *Britains*, about the Year of our Lord 890, called *Dwr-Gwyr*, according to *Aſſerius Menevenſis*, who was a *Briton* by Birth, and lived much about the ſame Time. The *Saxons* called them *Settan*, as we, at this Day, call that Tract or Spot of Land which they in particular inhabit, *Dorſetſhire*, or the *County* of *Dorſet*.—The Name of *Durotriges* is antient, and purely *Britiſh*; and it is highly probable, that that compound Term owes its Original to *Dour*, or *Dwr*, which, in the *Britiſh* Language, ſignifies *Water*, and *Trig*, an *Inhabitant*; which is much the ſame, as if we ſhould call them, *Dwellers* by the *Water*, or *Sea-ſide*.

The Word *Dwr-Setta* is a Compound of *Britiſh* and *Saxon*, and is of the ſame Signification as *Durotriges* before-mentioned; for *Settan*, among our *Saxon* Anceſtors, as well as other *Germans*, ſignified to *inhabit*, or *dwell upon*. Nor did the *Britains* deviate from the Senſe of the antient Name, when they ſtiled theſe *Durotriges Dwr-Gweir*; that is to ſay, *Dwellers* upon the Sea-coaſt; ſince their Country for near ſixty Miles together fronts the *Britiſh Channel*; being extended in Length from Eaſt to Weſt (with an uneven and meandring Shore) about ſixty-five

Miles, and in Breadth from North to South about thirty-three; which makes the whole Extent above 772,000 Acres of Land.

This County, in the Time of the *Heptarchy*, was a Province of the *Weſt Saxons*, and at this Day, together with *Briſtol*, makes up the Dioceſe of *Briſtol*.—This County is bounded on the North by *Somerſetſhire* and *Wiltſhire*, on the Weſt by *Devonſhire*, on the Eaſt by *Hampſhire*, and Southward (on which Side it is of the largeſt Extent) it is, as we have already hinted, all Sea-coaſt, by Virtue whereof the whole County are ſupplied with a Profuſion of the beſt Fiſh, and the Inhabitants have all the Opportunities imaginable of improving their Trade and Commerce.

King *Charles* the Second ſaid, "that he never ſaw a finer "Country either *in* the Kingdom of *England*, or *out* of it," a Declaration, which the Natives to this Hour boaſt of.

The Air of this County is for the moſt Part very good, and extremely wholeſome: On the Hills, indeed, it is ſometimes bleak enough; but very mild and pleaſant near the Coaſt.

As to the Soil of this County, it is for the generality very fruitful, though exceedingly ſandy; and even in thoſe Places where it is moſt deficient, as in the Northern and Eaſtern Parts, it yields good Store of Wood and Paſture, ſeveral Foreſts being ſcattered up and down, and fertile Vales between the verdant Hills, which bring us down to the Shore.

The principal Rivers wherewith it is watered, beſides a great Number of Rivulets and Brooks which fall into them, are the *Stour*, the *Frome*, the *Piddle*, the *Lyddon*, the *Dereliſh*, and the *Allen*; all which afford Plenty of Fiſh, ſuch as Trouts, Crawfiſh, *&c.* but the *Stour* is peculiarly remarkable, not only for the large Quantities, but the Goodneſs, and delicious Flavour of its Tench and Eels.

The two firſt, indeed, are the moſt worthy of the Reader's Attention. The *Stour* riſes, it is true, in the County of *Somerſet*, but ſoon enters this, and runs due South to a Town, called *Sturminſter*, where making an Angle, it forms a Courſe near Weſt-ſouth-weſt, and leaves *Dorſetſhire* about five Miles below *Winborn*, falling ſoon after into the Sea, at *Chriſt-church* in *Hampſhire*. The *Frome* takes its Riſe in the Eaſt End of this

County, and runs for the moſt Part Weſtward to *Wareham*, a little below which it falls into the *Bay*, called *Pool-Harbour*.

The Downs and Hills here are covered with great Flocks of large Sheep, whoſe Fleſh is very delicate and ſweet, and Wool ſo fine, that it is much coveted by the Clothiers, and by that Means proves a golden Fleece to both Buyer and Seller, and the Vallies abound with other Cattle. Butter is made here in its utmoſt Perfection. Here the Huſband-man reaps an ample Reward for all his Toil and Labour; for his Grounds produce either a Profuſion of Corn, or of Flax and Hemp, which laſt Commodity is allowed to be the beſt that grows in all his Majeſty's Dominions; inſomuch, that few Counties deal more extenſively in the Linen and Woollen Manufactures. Here are alſo plenty of all Sorts of Fowls and Birds both for Profit and Pleaſure; ſuch as, Swans, Ducks, Geeſe, Galls, Burranets, Woodcocks, Pidgeons, Pheaſants, Partridges, Fieldfares, and Poultry of all Sorts.

In ſhort, there is no Want of any Thing, that is neceſſary for the Maintenance and Support of Man; ſince both Sea and Land ſeem to vie with each other, and ſtrive which ſhall indulge his Appetite moſt, and yield him the greateſt Abundance. To all this we muſt add, that its fine Beer and Ale are univerſally admired, and by ſome preferred before the Wines of *France*.

And as it abounds thus with Proviſions of all Sorts, which are to be procured likewiſe at very reaſonable Rates, it is no great Wonder, that ſuch a Number of Families, even of high Diſtinction, make it their favourite Place of Abode; and that notwithſtanding its Capital is above one hundred Miles from *London*, its Inhabitants are as gay and polite, as thoſe in our Metropolitan City.

We ſhall now proceed to take Notice of what is moſt remarkable on the *Sea-coaſt*. And at the very Entrance into this County from *Devonſhire*, (of which we have already given, we hope, a ſatisfactory Account) ſtands a little Town, called *Limè-regis*, or *King's-Lime*, which is divided into two Parts by a little River, that is extremely commodious for the Inhabitants. It is ſomewhat difficult of Acceſs, it is true, as it is ſituated on a high ſteep Rock.—Notwithſtanding this Town, it muſt be allowed, about a Century ago, could ſcarcely be termed a *Sea-port*, yet it was frequented, even in thoſe Days by ſome Fiſhermen; and was re-

remarkable for the *Salt-pans*, which were uſed there for boiling the Sea-water. Of late Years, however, its Harbour, called the *Cobbe*, has been greatly improved, at the Expence of ſeveral eminent and ſubſtantial Merchants, and is ſo well ſecured againſt tempeſtuous Weather, not only by the Rocks, but a great Number of lofty Trees, that there is not ſuch another, 'tis thought, in all his Majeſty's Dominions. This Town, in ſhort, ſmall as it is, at this preſent Time is the Seat of a good Trade; but when that Branch of it flouriſhed, which indeed was ſome Years ſince, called the *New-found-land Trade*, the Cuſtoms then produced for ſome conſiderable Time was very little leſs than 16,000 *l. per Ann.*

Not far from *Lime-regis*, the River *Carr* empties itſelf into the Sea, from whence the little Village, now called *Charmouth*, derives its Appellation.

Burt-port, alias *Birt-port*, or *Brid-port*, lies not far from *Charmouth* between two ſmall Rivers, in ſuch a particular Soil, that it produces Hemp to a greater Perfection, than in any other Part, not only of the County we are now ſpeaking of, but any other whatſoever. And as an inconteſtible Proof of the Truth of that Aſſertion, this Town, tho' otherwiſe inconſiderable, was heretofore ſo famous for making Ropes and Cables for Ships, that it was provided by a ſpecial Law, which was made to continue for a certain Time, that ſuch Tackle, as ſhould be appropriated to the Service of the *Engliſh* Navy, ſhould be made no where elſe; and at this Time, the Staple Trade of the Town conſiſts in making the largeſt Seans, and Nets of all Kinds uſed in the *Britiſh* Fiſhery. And notwithſtanding this Place can ſcarcely bear the Name of a *Port* (though at the Mouth of the River that runs by it, which is encloſed with Hills on both Sides) yet Nature ſeems to have projected a very commodious Place for a Harbour; and, doubtleſs, long e'er this, it had been actually accompliſhed by Art and Induſtry, had not the Tides, through Misfortune, perpetually barred it with Sand; and it ſeems, no Expedient, though many have been tried, can be found out, that will anſwer the wiſhed-for End.—The Fiſhermen of this Place, in the Seaſon for *Mackarel*, not only take them in the eaſieſt Manner imaginable, but in ſuch prodigious Plenty, that ſometimes pro-

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per Watches have been ſet to prevent the Farmers, in the adjacent Parts, from manuring their Lands with them, which might poſſibly, as they imagine, infect the Air, and, conſequently, prove fatal to themſelves and their Neighbours round about them.

North-Eaſt of *Lime-Regis* before-mentioned, ſtands *Wingford-Eagle*, near which, in a Ground called *Fern-down*, upon the Road to *Brid-port*, is a *Barrow* (among many others in the Parts adjacent) which ſome few Years ſince was opened and ſearched. Upon the firſt Removal of the Earth, the Work-men found it full of large Flints, and at length came to a Place, in all Reſpects, like an Oven, clayed round in a very artful Manner, wherein they found divers Urns moſt exquiſitely wrought; but what is very remarkable, moſt worthy the Attention of the Curious, and moſt pertinent, indeed, to our preſent Purpoſe, is the following extraordinary Circumſtance; that is to ſay, one of the Labourers, putting his Hand into the Oven, when it was firſt opened, pulled it haſtily back, not being able to endure the Heat; and ſeveral others, out of Curioſity, following his Example, affirmed it to be hot enough to bake a Batch of Bread.

In the Pariſh of *Winterborne*, not far from the Ground called *Fern-down* aforeſaid, and in an Incloſure, near the high Road to *London* ſtand Nine Stones in a circular Form; and about half a Mile farther, three more, all of different Sizes, but the higheſt is Seven Foot; each of which is generally imagined to be a Lump of Flint.

As the Shore from *Brid-port* before-mentioned, winds very much, it runs out into the Sea; and there a Bank of Gravel and Pebbles, which are thrown up, and called *Cheſil*, with a narrow Sea running between that and the Shore, continues for ſeven or eight Miles together, by which Shelf of Sand, *Portland*, which was formerly an Iſland, is now joined to the Continent.

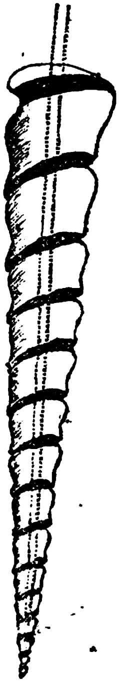
As to the Etymology of that Peninſula, *Cambden* ſeems to be ſomewhat in Doubt; ſome imagine, ſays he, that it is called *Portland*, becauſe oppoſite to the Port, called *Weymouth*; but the moſt probable Conjecture, in his Opinion, is, that it derives its Name from one *Port*, a gallant *Saxon*, who annoyed this Coaſt about the Year of our Lord 523, and poſſeſſed himſelf of this commodious Spot of Ground, as an Aſylum, or Retreat for himſelf and his Fellow-Pyrates.

Tho' this Iſland, or Peninſula, is but about ten Miles in Circumference, and inhabited only here and there; yet it affords Plenty of Corn, and very commodious Paſture for Sheep; but Wood and Coal are ſuch ſcarce Commodities there, that the Inhabitants are obliged to make Uſe of Cow-Dung, dried in the Sun, for Fewel.

The Natives are for the moſt Part Stone-Cutters, and, like the antient *Baleares* in the Mediterranean Sea, were formerly the beſt Slingers of all the *Engliſh-men:* And their *Road*, called *Portland Road*, affords a very ſafe Harbour for Ships in tempeſtuous Weather. It is very dangerous however, for any Veſſels to paſs over *Portland Race*, (where the two Tides meet with very violent Surges of the Waves) tho' the Weather be ever ſo calm. From this Peninſula comes our beſt and whiteſt Free-Stone, with which, not only the Cathedral of St. *Paul*, but the Monument likewiſe, and all the moſt magnificent Edifices in the City of *London* are principally built; and the Quarries from whence thoſe Stones are dug are well worthy of the Obſervance of the moſt curious Naturaliſt.

Thoſe who are delighted with natural Curioſities, are highly amuſed here with a great Number of *Shells* of Oyſters, Muſcles, Cockles, *&c.* but above all with the *Spirals*, or *Screws*, as they vulgarly call them, which every where abound in this Stone, and of a Size and Figure beyond any Thing we find in other Places.

And ſince theſe Stone-Spirals are allowed to be the greateſt Curioſity, and peculiar to this Place, we here give the Figure of one which we brought from the Iſland. We ſaw others much larger in the Stones; but it is very difficult to get them out whole; for being of the ſame Subſtance with the Stone, they are very friable, and generally break in taking out. They are perfectly ſolid, and ſo nicely coiled about an imaginary Axis, that they form a Bore as equal and regular as that of a capillary Glaſs Tube, which is here repreſented by the dotted Lines through the Middle of it.



In ſome Quarries, on the South-weſt Part of the

Iſland, there is found a Sort of Stone, which they call (with good Reaſon) the *Sugar-candy-Stone*, of which there are two Sorts, *viz.* one *pale*, like *white Sugar-candy*; and the other of an *Amber-colour*, like the *brown Sugar-candy*; and indeed, they ſo much reſemble *Sugar-candy* in the *Lump*, that any Perſon might be impoſed upon by them, till his Tongue and Teeth convinced him, that they were nothing but an inſipid Exudation of Juices, petrified, chryſtallized, and candied up by Nature in this Manner.

The whole Iſland, indeed, is little more than one continued Rock of Free-Stone; and the Height of the Land is ſuch, that from thence one may ſee, when the Weather is clear and ſerene, above half over the Channel to *France*, tho' here it is very broad. The Sea off this Peninſula, but more particularly to the Weſt of it, is looked upon as the moſt dangerous Part of the *Britiſh* Chanel. Due South there is almoſt one continued Diſturbance in the Waters, by reaſon of what is called *Two Tides Meeting*; which we conceive to be nothing more than the Sets of the Currents from the *French* Coaſt, and from the *Engliſh* Shore. This is commonly called *Portland Race*; and too many Ships, not duly aware of theſe Currents, have been embayed to the Weſt of *Portland*, and driven aſhore on the Beach, (of which we ſhall take particular Notice preſently) where they have been abſolutely loſt.

To prevent this Danger, and to guide the unwary Mariner under theſe Diſtreſſes, two Light-Houſes, indeed, have for ſome conſiderable Time been erected on the two Points of that Peninſula, which are doubtleſs very uſeful, and anſwer, in a great Meaſure at leaſt, the important End propoſed. Not far from theſe Light-Houſes, on the South Side of the Iſland, is a very remarkable Hole thro' the Earth, wide on the Top, and narrowing about ſeven or eight Feet downwards, there opens into a large ſubterranean Cavern, where you ſee the Waters of the Sea; which, in boiſterous Weather, preſent the Eye and Ear with tremendous Senſations: So large is this Cave, that ſome of the ſmall Craft, with their Sails up, have been driven within it, and ſeen thro' the Hole.

Tho' *Portland* ſtands a League at leaſt from the Main-land of *Britain*; yet it is almoſt joined by a prodigious *Riff* of *Beach*, that is to ſay, of ſmall Stones caſt up by the Sea, which runs from the Peninſula ſo near the Shore of *England*, that they ferry over with a Boat and a Rope, the Water not being above half a Stone's Throw over; and the ſaid *Riff* of Beach from that Inlet of Water, turns away Weſt, and runs parallel with the Shore quite to *Abbotſbury*, a Town about ſeven Miles beyond *Weymouth*.

We mention this in order to explain more clearly what we mentioned before of Ships being embayed, and loſt here: This is, when, coming from the Weſtward, the Sailors omit to keep a good Offing, or are taken ſhort by contrary Winds, and cannot weather the High-lands of *Portland*, but are driven between *Portland* and the main Land, and run a-ſhore on that prodigious Beach.

On the Inſide of this Beach, and between that and the Land, is the Inlet of Water before-mentioned; it opens at about two Miles Weſt, grows very broad, and makes a Kind of *Lake* within the Land of about a Mile and an Half broad, and near three Miles in Length, the Breadth unequal. At the fartheſt End, Weſt of this Water, is a large *Decoy*, and the Verge of the Water well grown with Wood, and proper Groves of Trees for Cover for the Fowl. In the open Lake, or broad Part, is, perhaps, the largeſt *Swanery* in *England*; here thoſe Fowl live, feed, and breed; and they are ſo numerous, that ſometimes 7 or 8000 are ſeen flocking together; and ſeveral of them are frequently ſeen likewiſe upon the Wing, very high in the Air; from whence we may rationally conclude, that they fly over the *Riff* of *Beach*, which parts the Lake from the Sea, to feed upon the Shores. From hence, Weſtward, the Lake narrows, by Degrees, till the Beach joins the Shore.

Not far from *Portland* lies the Iſland of *Purbeck*, which formerly was full of Heath, Woods, and Foreſts, well ſtocked with Fallow-deer, and Stags: And tho' we are convinced, that it is not ſo at this Day; yet there is very good Land towards the Southern Part of it; and Under-ground (as *Cambden* informs us) there are Veins of Marble here and there, and divers Kinds of ſuch good and ſubſtantial Stones, that the Cathedral Church of *Saliſbury* was erected therewith, and large Quantities thereof are, at this Day, carried to *London*, to the no ſmall Profit and Advantage of the Inhabitants.

Tho' *Purbeck* is called an *Iſland*, yet, in Reality, it is a *Peninſula* only; for there is a good Paſſage enough into it without croſſing any Water at all. It is ten Miles in Length; but not more than five, or ſix, in Breadth. It is bounded on the South and Eaſt, with the *Britiſh* Sea; on the North with the River *Frome*, and on the Weſt with a Mooriſh *Lake*, which runs into the *Frome*, called *Luxford-Lake*.

At the firſt Entrance into this Peninſula, there lies a large Flat of barren, heathy Ground, (which is, however, well repleniſhed with red Deer) ſevered from the Reſt, with almoſt a continued Ridge of very high Hills, which when once paſſed over, there are Grounds of a much better Nature, affording excellent Paſture for Sheep, Food for other Cattle, and Plenty of good Corn; as alſo Quarries of laſting Stone, and Mines of ſpotted and blue Marble. To the Eaſt, the Bank of the Sea winds very much inward, and finding a narrow Inlet, or Paſſage, widens itſelf into a Bay of great Breadth.

North of *Purbeck*, in a Peninſula not far diſtant from it, is a fine Sea-port Town called *Poole*, which is ſurrounded every Way with Water, but to the North, where it is joined to the Continent. It is highly probable, that it took its Name from the *Bay* below it, which, when the Weather is perfectly calm, looks like a Standing-water, or Pool. By the Reſort of Ships hither, for Want of a ſufficient Depth of Water at *Wareham*, this is become, not only the moſt conſiderable Town in the whole County, but in all that Part of *England*. There are, for the generality, a great Number of Ships at Anchor therein; but eſpecially a great Number are there fitted out annually to the *New-found-land* Fiſhery.

A little below *Wareham*, this Bay receives the *Frome*, and the *Piddle*, the two principal Rivers of the County.

In the Arm of the Sea here, called *Luxford-Lake*, the Tide ebbs and flows four Times in twenty-four Hours. This Place is remarkable for its vaſt Plenty of Mackarel in the Seaſon, and a Profuſion of other good Fiſh, with which it ſupplies *Wilts*, and the Inland Parts of *Somerſet*; but more eſpecially, for the beſt Oyſters in all this Part of *England*, which are ſaid to be excellent for pickling; and it is obſerved, that they have more *Pearl* in them, and are larger than any others in the whole Kingdom.

They are barrelled up here, and ſent, not only to *London*, but to the *Weſt-Indies*, *Spain*, *Italy*, *&c.* Great Quantities of Corn and Pulſe likewiſe are frequently exported from hence abroad, as alſo of *Purbeck* Stone.

On the 20th of *June*, 1653, we are told, that a Shower of Blood fell down in this Town, from a black Cloud, and tinged the Leaves of the Trees there with *Red*; ſeveral of which were ſent to *London*, and were looked upon as great Curioſities, by ſuch as were *Virtuoſi* at that Time. And as the Common-people in thoſe Days were more ſuperſtitiouſly inclined than they are at preſent, this extraordinary Occurrence was almoſt univerſally deemed ominous, and declared a manifeſt Indication of ſome dreadful Judgment hanging over the Head of the whole Kingdom; it was evident, however, that thoſe Surmiſes were all idle and groundleſs; for no ſignal Calamity enſued; but on the contrary, the Nation lived in Peace and Plenty for many Years afterwards. *

In the weſtern Part of the Shire, at the Riſe of the River *Frome*, the Soil is exceedingly fruitful, and *Blackmore-Foreſt*, commonly called the *Foreſt of White Hart*, tho' at preſent but naked, was once well-wooded, and now affords very good Hunting. The Inhabitants have a Tradition concerning the Occaſion of its Name, which ſeems natural enough; namely, that King *Henry* III. hunting once on this Spot, and having run down ſeveral Deer, ſpared the Life of a *milk-white Hart*, which was afterwards took and killed by one *T. de la Linde*, a Gentleman of this County, and ſome of his ſporting Companions; but they were ſoon convinced of their Folly and Preſumption; for his Majeſty ſo highly reſented the Indignity, that he made them pay into his Exchequer an annual Fine, called *White-hart-ſilver*, as long as he lived.

In divers other Parts of this County beſides *Portland* and *Purbeck*, there are various Sorts of white, reddiſh, and greyiſh Stones for Building; and others, which are ſofter, are very excellent for ſome particular Uſes, ſuch as to make *Plaiſter of Paris*, *&c.*

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* We mention this Paſſage only to ſhew, how hurtful a Thing *Credulity* is in an *Hiſtorian*; how vain and pernicious Superſtition is; and how abſurd and groſs the Miſtakes on which it is generally grounded. For that there never was any ſuch Thing as a Shower of *real Blood*, and how thoſe *odd Phænomena* are eaſily accounted for, we ſhall ſhew in its proper Place.

In this County likewiſe there are divers Sorts of uſeful *Earths* [illegible] down; but the *Tobacco-pipe-clay*, which is dug up [illegible] and *Hunger-hill*, near *Wareham*, is ſo excellent [illegible] that it is ſent to *Cheſter*, *London*, and many other Places.

Not long ſince, one *James Baron*, of *Mountjoy*, a very curious Naturaliſt, found out a little below *Canford*, in this County, certain Materials, of which he began to make *Calcanthum*, that is to ſay, *Copperas*, as 'tis commonly called, *&c.*

The Coaſt of *Dorſetſhire* is very diſſimilar, being in ſome Places bounded with high Lands and Cliffs, and in others with only a Beach of Pebbles; the Cliffs are in ſome Parts compoſed of *Sand*, *Earth*, and *loamy Clay*; in others they conſiſt of *Chalk*; but very few of Stone, except in the Iſlands. Between *Weymouth* and the Iſle of *Purbeck*, it is formed into a fine ſpacious Bay, and the Water is ſo deep, that the largeſt Merchant-ſhips come to this Port, and find a good Harbour there; and we had lately an Inſtance, that a Fiſh of the largeſt Size may come ſo near the Shore at *Weymouth*, as to be left on the Sands at low Water. The Fiſh I ſpeak of was a young Whale about 55 Feet long, and it is remarkable, that the Head of this Fiſh was very large, and its Tail but ſmall in Proportion to the Reſt of the Body. For the upper Jaw-bone, which only meaſures about 14 Feet in Length, is between five and ſix Feet over, and two or three Feet deep, conſiſting, on the lower Part, of ſeveral long, broad Bones, like 12 Feet Planks, and indeed the Whole has the Appearance, at a Diſtance, of an old worn-out *Wherry-boat*. The *Skull*, on the Inſide, meaſured four Feet nearly, and the Hole for the Egreſs of the Spinal-marrow was ſix Inches over. The Vertebræ of the Back-bone were very large; one we meaſured was 11 Inches long, and 12 Inches thick, and nearly of a cylindric Form. The Tail meaſured not quite 12 Feet in the wideſt Part, which is not ſo wide as the Tails of ſome Fiſhes not 20 Feet long.

In the Cliffs near *Brid-port* there are many curious Productions of the Foſſil-kind, and if we miſtake not, large Quantities of *Copperas-Stone*; but the *Cornua Ammoni* are very beautiful, being overlaid with a Gold-like Mundic, and very regular and perfect. And here are taken the largeſt *Prawns* and *Shrimps*, perhaps, in *England*.

On the *Dorſet* Coaſt, too, you find a great Variety of beautiful Shells, and probably more than in any other Part between that and the Land's End. This is ſufficiently proved by a valuable Collection of a Gentleman in *Melcomb-Regis*, which he has taken up himſelf from the Shore near thoſe Towns.

I ſhall now cloſe the Deſcription of this Country, with the Character of its Inhabitants (both antient and modern) extracted from a Survey thereof, publiſhed from an antient MS, written by the Rev. Mr. *Croker*, formerly of *Mapowder*, in the ſaid County.

“ The antient Inhabitants (ſays he) were the *Durotriges*, “ who lived under the Government of the *Romans*. Afterwards, “ when the *Saxons* had made themſelves Lords of this Kingdome, it fell under the Juriſdiction of the *Weſt Saxons*, whoſe “ Kings often reſided at *Corfe*, a Caſtell in the Iſle of *Purbeck*; “ but the *Normans*, driving them out, poſſeſſed their Places, “ who, as in all other Countries, conſiſted chiefely of Gentrie; “ and commonlie the Gentlemen for the moſt Parte are of antient “ Deſcent, and their Houſes, either by Succeſſion or Match, “ have a longe Time continued in their Name or Blood. Soe “ that I cannot generallie complaine, as one doeth of another “ Shire, that the Gentrie were of noe antient Stockes. Beſides “ to their Blood, they adde manie good Graces and Qualities, “ as Learneing and Humanitie, which tho' ſomethinge remote, “ they bring from the Univerſities. Moreover, they are endowed with much Frendſhip one towards another; which “ hath been the Cauſe of their frequent matching amongſt themſelves; ſoe as they are for the moſt Parte in ſome Degrees of “ Conſanguinitie allied: Yet are not the Bonds of Affinitie and “ Neighbourhoode ſoe ſtrong, as to tie them onlie to themſelves; but their Humanitie extendeth even unto Strangers, “ unto whom they are generallie noted to bee verie kinde, and to “ ſhew them accordeing to their Degrees both Reſpects and “ Courteſies. From the Gentells, I will come to the Marchant, “ who, with Fiſhermen, inhabite the maritime Townes. The “ inlande Townes are inhabited by Tradeſmen, who ſo abound “ therin, that they furniſh themſelves and their neighbouring “ Counties with what *France*, *Spaine* and *Eaſt-Lands* afforde; “ by reaſon of the great Quantities of Cloth made in the chiefe his

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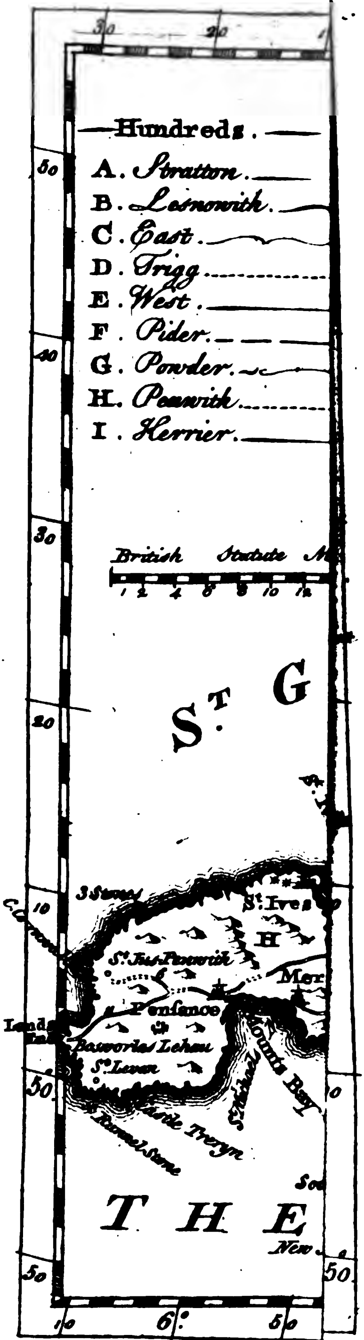

“ Towne of *Dorcheſter*, *Wareham*, and other Places of this
“ Countie.

“ From the Merchant, I will deſcend to the Commons, who
“ are commonly Copy-holders, and by their Cuſtoms are tied to
“ do many Services unto their Lords. Some of them are Free-
“ holders, whom we, from the *Saxons* (*Yemen*) call Yeomen:
“ But theſe and the rich Farmers, who are thoſe that take De-
“ meſnes of Gentlemen at a Rack-rent, (for that is the Man-
“ ner of this Country) do now begin much to encroach upon
“ the Gentry; and from them, divers Times, iſſue Families
“ of Note.”

As to the modern *Dorſetſhire* Gentry, they are very much like the Soil they live on, open, free and generous; full of Life and Spirit; good Artiſts and Mechanics in general, and their Heads well turned to Trade and Merchandize; as appears by the many large and flouriſhing Towns of Trade, eſpecially near the Sea Coaſt; they are gay and polite at the ſame Time, very ſtudious and Lovers of Science in every Shape; and conſequently no great Friends to Superſtition. —— Tho' there is no general Rule without Exception. In ſhort, you no where breathe a finer Air, nor converſe with a better Set of People.

A CATALOGUE *of* PLANTS *in* Dorſet, *in and near* Dorcheſter, Blandford, Woodbery-hill, Beer, Wareham, Weymouth, Portland, Abbotſbery, Neatherbery, Charmouth, and Chiddick. *Communicated by Mr.* PIKE *of* Biddeford, *Botaniſt.*

Adders-tongue.
Agrimony.
Alexander.
Arſmart, hot.
——, cold.
Aaron.
Arrow-head.
Bank Creſſes.
Baſtard Balm, white *and* red.
Baſtard Gromell.
Bettony.
Berry-bearing Orach
Beſſom Moſs.
Birds-neſt.
Bitter Sweet.
Birds-foot, Great
Ditto ſmall.
Biſhops-weed.
Black Henbane.
Ditto Matfellon.
St. Bryone.
St. Fern.
Blood-wort.
Brook-lime.
Broad-leaved Ragweed.
Branched Bur Reed.
Broad Plantain.
Broom.
Bugle.
Branched Sea Moſs.
Bugloſs.
Bugloſs Cowſlips.
Beter Bure.
Borage.

Butchers Broom.
Calamint.
Calamus Aromaticus.
Cats-tail.
Cats-tail Graſs.
Cammock.
Centory.
Celandine.
Cinquefoil.
Clowns Wound-wort.
Cocks-foot Graſs.
Cotton Graſs.
Cotton Groundſell.
Corn Scabious.
Corn Marigold.
Crowfoot Treefoil.
Comfry.
Cockle.
Crowfoot.
Croſs-wort.
Creeping Iron-wort.
Coltsfoot.
Columbines.
Cowſlips.
Creeping Mouſe-ear.
——— John's-wort
Crow Garlick.
Corn Horſe-tail.
Cuckow Flowers.
Corn Graſs.
Cyprus Graſs.
Dogs Stones, white and red.
Darnell Graſs.
Dittander,
Dock Creaſſe.
Dandelion.
Double Sope-wort.
Dodder.
Dutch Agrimony.
Devils Bit.
Dane-wort.
Dwarf Mallow.
Doves-foot.
Earth-nutt.
Engliſh Coraline.
Eye-Bright.
Feather-top Graſs.
Fern Graſs.
Female Fools Stones
——— Royal Satyrion.
Field Muſtard.
Flowering Sea Plantain.
Fine Chickweed.
Female Pimpernel.
Fern Moſs.
Flower Branched Moſs.
Fluellen.
Fox-glove.
Fennel.
Fumetory.
Female Fern.
Flat-headed Globe Thiſtle.
Great Water Graſs.
Great Fox-tail Graſs
Great Baſtard ditto.
Galingale.
Groundſel.
Golden Mouſe-ear.
Gooſe-foot.
Great Water Dock.
Golden Maiden-hair
Ground Moſs.
Ground Liver-wort.
Graſs Wracke.
Glaſs-wort.
Great Wild Thyme.
Great Gromel.
Great Chickweed.
Great Daiſie.
Great Fig-wort.
Great Matſellon.
Great Knapweed.
Great Bur Dock.
Great Marſh Marigolds.
Golden Saxifrage.
Ground Ivy.
Gout-wort, *or*, White Aſh.
Gooſe Graſs.
Hedge-hog Graſs.
Hairy Graſs.
Hairy Wood Graſs.
Hooded Matweed.
Hair Blue Bells.
Harts-horn Plantain
Hedge Hyſop.
Horehound.
———, ſtinking Hedge Nettle.
Hounds-tongue.
Hearts Eaſe.
Hop Trefoil.
Hart Trefoil.
Herb Robert.
——— Bennet.
Hemlock.
Horſe-tail.
Hawkweed, 13 ſorts.
Harts-tongue.
Hedge Chervil.
John's-wort.
Iron-wort.

Kneed Graſs.
—— Water Graſs.
Knotty Dogs Graſs.
Knotted Dandelion.
Knobbed Sheeps Sorrel.
Knott Graſs.
Knotted parſley.
Kings Claver, *or* Melilott.
Lady Lace Graſs.
Lady Tracis.
Leſſer Spotted Fools Stones.
Lady Smocks.
Lambs Lettuce.
Looſe Strife.
Long Leaved Sengreen.
Little Silver Knapweed.
Leſſer Burdock.
Ladies Bedſtraw, red, white and yellow.
Lady Thiſtle.
Matweed.
Marſh Dogs Stones.
Male Fools Stones.
Male Royal Satyrion
Marſh, Ditto.
Mercury.
Mouſe-tail Plantain.
Mountain Flax, *or* Mill-mountain.
Milk-wort, purple, red, blue, white.
Mountain Pink.
Marſh Chickweed.
Money-wort.
Mouſe-ear.
Mother-wort.
Middle Scabious.
May-weed, *or* Wild Camomile.
Mullin.
Maſter-wort.
Mug-wort.
Madder.
Male-fern.
Maiden-hair.
Monk's Rhubarb.
Nettles, 3 Sorts.
Oak-moſs.
Pearl Graſs.
Plantain.
Parſley-break-ſtone.
Portland Sengreen.
Peter's-wort.
Pimpernel.
Purple Money-wort.
Party-colour'd Horſe Mint.
Primroſe.
Plowmans Spikenard
Perwinkle.
Polypody.
Prickly-head Globe-thiſtle.
Purple Trefoil.
——— Cammock.
Quiver Graſs.
Queen of the Meadow.
Red Dwarf Graſs.
Ruſh Hard Graſs.
—— Water Graſs.
Ramſons.
Ragweed of the Water.
Red Poppy.
Rib-wort.
Roſe Rib-wort.
Red Campion,
Ruſh Pink.
River Chickweed.
Rew-leaved Whitlow Graſs.
Red Valerian.
Red Archangel.
Red Rattle.
Red Yarrow.
Small Hard Graſs.
Small Fox-tail Graſs
—— Baſtard, Ditto.
Stitch-wort.
Spotted Dogs-ſtones
Small Wild Muſtard.
Sea Rag Weed.
Shepherds Purſe.
Small, Ditto.
Sea Orach.
Scorpion Graſs.
Sharp-pointed Dock
Sorrel.
Sheeps, Ditto.
Snake Weed.
Small, Ditto.
Spoon-wort.
Sea Lavender,
Sea Star-wort.
Sea Lung-wort.
Sea Oak, *or* Wrake.
Sea Thongs.
Sea Thrift.
Sea Girdles.
Sea Fennel.
Sea Plantain.
Swines Creſſes.
Sope-wort.
Spurge,

Sea Spurge.
Sea Purſlane.
Sea Penny-wort.
Sampier.
Small Gromel.
Small Chickweed.
Sea Chickweed.
Snail Glaſs-wort.
Speed-well, *or* Veronica.
Spatling Poppy.
Scabious.
Sace alone.
Sanicle.
Smallage.
Shepherds Needle.
Sea Wormwood.
Teaſell.
Toothed Moſs.
Tormentil.
Thiſtle upon Thiſtle.
Violets, white and blue.
Vipers Bugloſs.
Vervain.
Wood Ruſhy Graſs.
White Hair Bells.
White Coraline.
White Daffodil.
Wild Garlick.
Water Creſſes.
Water Parſnep.
Water Scorpion Graſs.
White Wind Flowers.
Water Plantain.
Wall Flowers.
White Campion.
Wall Pepper.
Water Penny-wort.
Wall, Ditto.
Wild Thyme.
Water Mint.
Water Calamint.
Water Horehound.
Water Agrimony.
Water Bettony.
White Archangel.
White Ox-Eye.
White Bindweed.
White Water Lilly.
White Cinquefoil.
Wood, Ditto.
Wild Angelica.
Wild Parſley.
Wild Nigela.
Wormwood.
Wood Horſe-tail.
White Maiden-hair.
White Cotton Thiſtle.
Wolfe Claw Moſs, 6 or 7 Feet long.
Yellow Daffodil.
Yellow Horn-poppy
Yellow Archangel.
Yellow Fig-wort.
Yellow Water Lilly.
Yellow Trefoil.
Yellow Cammock.

THE NATURAL HISTORY OF *SOMERSETSHIRE*.

AS the antient Inhabitants of *Dorſetſhire* (of whom we have given before an Account) were known and diſtinguiſhed by the Name or Appellation of the *Durotriges*; ſo the Natives of the County whereof we are now ſpeaking, who lie from them to the North and Eaſt, were called *Belgæ*, who from that Name, and indeed from other very good Authority, ſeem to have come into *Britain* from among the *Belgæ*, a People of *Gaul*. It does not, however, preciſely appear, at what Time they came over; neither is it clear from whence the Name of *Belgæ* ſhould be derived. Mr. *Camden* is inclined to favour the Opinion of thoſe, who derive it from the old *Gauliſh* Tongue, which our *Welch* (in a great Meaſure) keep intire, and who aſſure us, that the Term *Belgæ* owes its Original to the Epithet *Pel*, which ſignifies *very remote*. And it is beyond all Contradiction, that they were the remoteſt People in *Gaul*; and at the greateſt Diſtance from the *Roman Province*, not only in regard to their Situation, but in Point of Humanity and good Manners. Let us now come to our *Belgæ*, who at this Day are the Natives of *Somerſetſhire*.

This County is not only very extenſive, but remarkable for its Profuſion of all the Conveniencies of Life. *Briſtol Channel* beats upon it on the North; it bounds upon the County of *Devon* to the Weſt; and on *Wiltſhire*, and ſome Part of *Glouceſterſhire* to the Eaſt.

The Soil of this County is very rich, and is principally employed in Grain and Paſturage. Beſides, 'tis very populous, and is furniſhed with ſeveral commodious Harbours. Some Hiſtorians are of Opinion, that it owes its preſent Title of *Somerſet*, becauſe the Air, in thoſe Parts, is mild and gentle, and, as it were, a *Summer-Air*; in which Senſe the *Britons*, at this very Day diſtinguiſh it by the Appellation of *Gladarhaf*, which bears the ſame Signification as our *Engliſh* Term juſt mentioned. Mr. *Cambden*, does not ſcruple to affirm peremptorily, that it derives its Name or Appellation, from *Somerton*, which was formerly the principal, and moſt celebrated Town throughout the whole County; ſince one *Aſſer*, a very antient, and credible Hiſtorian, calls it *Somertun*, where ever he has Occaſion to make Mention of the Place.

Upon the *Severn-ſea* (where this County borders on *Devonſhire*) the firſt Places we meet with, of Note, are *Minehead*, *Dunſter*, and *Watchet*, for *Portlock*, at preſent, is inconſiderable; tho', in *Camden*'s Time, *Portlock* and *Watchet* only are mentioned as Towns of Note; ſince then, *Dunſter* has been reputed the principal Town; but now *Minehead* is undoubtedly the chief Sea-Port, next to *Briſtol*, in the County.

At preſent, this little Port, *Watchet*, has but a very ſmall Number of Veſſels belonging to it, and thoſe are only Colliers, or act as Coaſters to *Briſtol*, where they ſupply the Glaſs-houſes with the Aſhes of Sea-weed; of which Abundance is burnt at this Town for that Purpoſe. Great Quantities of Alabaſter likewiſe, which fall down the Cliffs here by the Waſh of the Sea, are alſo ſent to that City. The Inhabitants, moreover, fetch vaſt Quantities of Pebble from the Coaſt, and burn it into Lime, for dreſſing their Lands; but more particularly for their Buildings; no Cement being more durable (it ſeems) for Maſonry, that is to lie under Water, where it grows as hard as Marble itſelf; and is generally called *Tarraſs*.

The Harbour of *Minehead* is one of the moſt frequented Paſſages to *Ireland*; and is of late Years very conſiderably improved by the catching of Herrings, which, about *Michaelmas*, come up the *Severn* in mighty Shoals, and being caught and cured, are ſent from hence to Markets up the *Mediterranean*, with great Advantage.

In the 12th Year of his late Majeſty King *William* III. a Statute was made for the recovering, ſecuring, and keeping in Repair,

pair, this Harbour, *for the Benefit and Support of the Navigation and Trade of this Kingdom.*

On the Rocks and Pebbles, where the *Severn* waſhes them, more particularly near *Old Cleve*, which lies between *Dunſtar* and *Watchet*, grows the *Lichen-Marinus*, or *Sea Liver-wort*, commonly called *Laver*. To this Place, when the Tide is out, the Inhabitants come and gather it, and when cleanſed and pickled, ſend it to a great Diſtance; being of a pleaſant Taſte, very nouriſhing, a good Anti-ſcorbutic, and of excellent Uſe by Way of Diet and Medicine.

Near *Nettlecomb* lies *Eaſt Quantock-Head*, from whence runs a Ridge of Hills (of the ſame Name) through a rich Country, Southward as far as the Vale called *Taunton-Dean*; affording a Proſpect, extremely pleaſing to the Eye, by Reaſon of its great Variety of Sea and Land, of Barrenneſs and Fertility, to the greateſt Extent every Way, perhaps, of any other Hill in the Kingdom.

At *Start-point*, two of the largeſt Rivers in the whole County (meeting together) empty themſelves at one Mouth called, by *Ptolomy*, the *Æſtuary* of *Uzella*, from the River *Ivell*, which leaves that Name before it reaches ſo far. It riſes in *Dorſetſhire*, and at its firſt-coming into *Somerſetſhire* gives Name to a well-frequented Market-town called *Evell*, or *Yeovil*, and receives a little River; upon which is *Camalet*, or *Camel*, a ſteep Mountain of a very difficult Aſſent, on the Top whereof is an Area of 20 Acres and upwards. Amongſt divers Curioſities of Art and Nature here, *Leland* cries out, in a Kind of Extaſy, *Good Lord! What Precipices are here!* and looks on it as a great Wonder of Nature.

At *Eaſt Chenock*, near which the River *Pedred*, commonly called *Parret*, runs, there is a *Salt Spring* above Twenty Miles from the Sea.*

Taunton, (which receives its Name from the River *Thone* which waſhes it) and the Country all about, is beautified with green Meadows, and abounds in delightful Gardens and Orchards, which charm the Eyes of every curious Spectator. This Town is very populous, and ſome Thouſands are employed in the Manufacture of Serges, Duroys, Sagathies, Shalloons, &c. for weaving whereof 1100 Looms have been employed at a Time; and Children (provided they be but ſix or ſeven Years of Age) are able to earn their Bread at this Manufacture. The *Thone* (by Act of Parliament in the Reign of King *William* the IIId.) was made Navigable, for Barges, from this Town to *Bridgwater*; and for the better Support of their Navigation there is a certain Toll appointed.

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* From a *Wine-Quart* of the Water of this Spring Dr. *Highmore* obtained by Evaporation 80 Grains of Salt; tho' it was then not ſo ſalt as uſual, by reaſon of Rains that had fallen juſt before.

Philoſop. Tranſ. N°. 56.

Taunton-Dean, as it is vulgarly called for the *Vale* of *Taunton*, is a Tract of Land of about thirty Miles Circumference, and ſo remarkably fertile, that, to ſpeak in their own Phraſe, *with the Sun and Soil alone*, it needs no Manure for the Improvement of it.

At *Somerton*, which was once the moſt celebrated Town in the whole County, and the Place likewiſe from whence it took its Name, there is an adjacent *Moor* of about 20,000 Acres of fine Paſture Ground for the grazing of Cattle Gratis, by ſuch of the Inhabitants as have Right of Common. The chief Support of the Place at preſent however, is its Markets and Fairs for Cattle. For to them the Butchers reſort from *Briſtol*, *Bath*, *Wells*, *Frome*, *Saliſbury*, *Dorcheſter*, and even from *Wincheſter*. And in the 10th Year of the Reign of King *William* III. it was provided by a Statute then made, that the antient Water-courſes of the above mentioned Moor ſhould be opened, and new ones made, for rendering it more healthful, as well as more advantageous to the Inhabitants of the Parts adjacent.

Tho' *Bridgwater* ſtands about 12 Miles from the *Start-point*, where the *Parret* runs into the *Briſtol Channel*, yet from thence a Spring Tide flows 22 Feet, at leaſt, at the Key, and comes in with ſuch an impetuous Torrent, and ſuch a Noiſe, that it is called, *the raging Boar*. Ships of 200 Ton frequently come up to its Key; by which Conveniences for Navigation, the Inhabitants carry on a pretty good Coaſt-trade to *Briſtol*, to *Wales* for *Coals*, to *Cornwall* for *Slate*, &c. and 20 Coal-ſhips, at leaſt, are conſtantly employed. The Receipt of the Cuſtoms here amount to about 3000 *l.* a Year. Its foreign Trade is principally to *Portugal* and *Newfoundland*. Wool is brought to this Town in good Quantities from *Ireland*. A great retail Trade

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is carried on here for Corn, Cattle, Hogs, and Sheep; and it is as remarkable for good Cheeſe as almoſt any Market Town throughout the Kingdom of *England*. In a Word, the beſt of Proviſions are ſo cheap here, that it may, with Propriety enough, be term'd a *Paradiſe* for *Epicures*.

At *Bruiton*, or *Bruton*, ſo called from the River *Bru* or *Bruis*, whereon it is ſituated, the Inhabitants carry on a great Trade in Serges, Stockings, Malting, &c. and about five Miles from thence, on the Banks of the ſaid River, lies *Alferd*, where ariſes a *Mineral Water*, of a purging Nature, no ways inferior to thoſe at *Epſom*, or any other Medicinal Waters whatſoever. This Water is of great Benefit to theſe Weſtern Parts of *England*; ſince from hence it is carried to divers Places very remote. Then the River, running a long Way thro' nothing but ſmall Villages, with the Encreaſe of a few Rivulets, waters a pleaſing Variety of fruitful Fields; 'till meeting with a ſofter Soil, it ſtagnates, as it were, and forms a little Iſland, which the old *Britains* called *Yniſwitrin*, which afterwards the *Saxons* interpreted into *Glaſtonbury*, or the *Town* of *Glaſs*, ſo called on Account of the River's encompaſſing the *Marſh*, which is as clear as *Chryſtal*, and, as it were, of the Colour of *Glaſs*; it was likewiſe called *Avalonia*, or the *Iſle* of *Avalon*: It had the Name of an Iſland, on Account of its being formerly ſurrounded by a deep *Marſh*; and *Avalon*, either from the *Britiſh* Term *Avala*, which ſignifies an *Apple*; becauſe it abounded with Apple-trees, when it was cleared from Wood and Buſhes, and firſt made habitable; or elſe from One *Avallon*, who was once Lord of that Territoty.

An antient Poet has given us the following Encomium on this *Fortunate Iſland*:

Inſula Pomorum, quæ fortunata vocatur,
Ex Re Nomen habet; quia per ſe Singula profert.
Non opus eſt illi ſulcantibus Arva colonis;
Omnis abeſt cultus, niſi quem Natura miniſtrat.
Ultro fœcundas Segetes producit, & Herbas,
Nataque Poma ſuis prætonſo Germine Sylvis.

Thus tranſlated by an anonymous Author in *Camden*'s Time.

The *Iſle* of *Apples*, truly fortunate,
Where unforc'd Goods and willing Comforts meet.
Not there the Fields require the Ruſtic's Hand;
But Nature only cultivates the Land.
The fertile Plains with Corn and Herbs are proud,
And golden Apples ſmile in ev'ry Wood.

In this Iſland there is a very remarkable Hill, called the *Tor*, from the *Tower* that is erected thereupon, which rears its Head to a prodigious Height; the Aſcent of it, however, is ſo difficult, that the very raiſing of the Stones to the Top of it was, in all Probability, much more expenſive than the Structure itſelf.

As this Hill is peculiarly remarkable for the *Holy Thorn*, or *Haw-thorn*, and *Walnut-tree*, that grew in the Church-yard there, we ſhall amuſe our Readers with tranſcribing an Account of both, from that learned Antiquarian Mr. *Thomas Hearne*.

“ The *Holy Thorn* of *Glaſtonbury*, (ſays he) which is ſaid to
“ bud and blow yearly upon *Chriſtmas-day*, grew on the South
“ Ridge of *Weary-all-Hill*, at preſent called *Werral Park*, a
“ Ground now, or lately, belonging to *William Stroud*, Eſq;
“ Whether it ſprung from St. *Joſeph* of *Arimathea*'s dry Staff,
“ ſtuck up by him on the Ground, when he reſted there, I can-
“ not find; but beyond all Diſpute, it ſprung up ſpontaneouſ-
“ ly *.

“ It had two Trunks, or Bodies, till the Reign of Queen *Eli-*
“ *zabeth*, in whoſe Days a ſaint-like *Puritan*, taking Offence at
“ it,

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* We have here inſerted this long Quotation from Mr. *Hearne*, on Purpoſe to give the Reader a Specimen of the abject State of the *Natural Hiſtory* of *England*, at a Period of Time ſo little diſtant from us. By which he will eaſily judge how neceſſary it is to reviſe this Subject, and ſet it in a Light that may do more Honour to our Nation. Superſtition and Enthuſiaſm, which leaven and corrupt every Thing where they are found, have proved the Bane of *Natural Hiſtory*; but being now in a great Meaſure baniſhed our Iſland, we can ſee clearly, that the *Walnut-tree*, and the *Thorn* are only particular Deviations from the common Standard of the Species; and theſe beautiful Digreſſions of Nature we ſhall have frequent Occaſion to take Notice of, as we proceed in our Survey.

“ it, hewed down the biggeſt of the two Trunks, and had cut
“ down the other Body in all Likelihood, had he not been mi-
“ raculouſly puniſhed (ſaith my Author) by cutting his Leg,
“ and one of the Chips flying up to his Head, which put out one
“ of his Eyes. Though the Trunk cut off was ſeparated quite
“ from the Root, excepting a little of the Bark, which ſtuck to
“ the Reſt of the Body, and laid above the Ground for more
“ than thirty Years together, yet it ſtill continued to flouriſh,
“ as the other Part of it did which was left ſtanding; and after
“ this again, when it was quite taken away, and caſt into a
“ Ditch, it flouriſhed and budded as it uſed to do before. A Year
“ after this, it was ſtolen away, not known by whom, or whi-
“ ther, as many old Perſons affirmed to Mr. *Broughton*, who
“ went on Purpoſe to *Glaſtonbury* to ſee this, and the other Cu-
“ rioſities and Antiquities of the Place.”

The remaining Trunk and the Place where it grew, Mr.
Broughton deſcribes, and ſays, “ That it was as great as the or-
“ dinary Body of a Man; that it was a Tree of that Kind and
“ Species, in all natural Reſpects, which we term a *White*
“ *Thorn*; but it was ſo cut and mangled round about in the
“ Bark, by engraving People's Names reſorting thither to ſee it,
“ that it is a Wonder how the Sap and Nutriment ſhould be
“ diffuſed from the Root to the Boughs and Branches thereof,
“ which were alſo ſo maimed and broken by Comers thither,
“ that he wondered how it could continue any Vegetation, or
“ grow at all; yet the Arms and Boughs were ſpread and di-
“ lated in a circular Manner, as far, or farther than other Trees,
“ freed from ſuch Impediments, of like Proportion, bearing
“ Hawes (Fruit of that Kind) as fully and plentifully as others
“ do. In a Word, that the Bloſſoms of this Tree were ſuch
“ Curioſities beyond Sea, that the *Briſtol Merchants* carried
“ them into foreign Parts; that it grew upon, or rather near,
“ the Top of an Hill, in a Paſture, bare and naked of other
“ Trees, and was a Shelter for Cattle feeding there; by reaſon
“ whereof, the Paſture being great, and the Cattle many, round
“ about the Tree, the Ground was as bare and beaten as any
“ High-way, Floor, or any continued trodden Place. Yet this
“ Trunk was likewiſe cut down by a military Saint, as Mr. *An-*
“ *drew Paſchal* calls him, in the Rebellion, which happened

" in King *Charles* the *Firſt*'s Time; however, there are, at " preſent, divers Trees from it, by Grafting and Inoculation, " preſerved in the Town and Country adjacent. Amongſt other " Places, there is One in the Garden of a *Currier*, who lives in " the principal Street; a ſecond at the *White-Hart-Inn*; and " a third in the Garden of *William Stroud*, Eſq;. There is a " Perſon about *Glaſtonbury*, who has a Nurſery of them, and " ſells them (as we are informed by the before named Mr. *Paſchal*) for a Crown a Piece, or more if he can get it."

Beſides the *Holy Thorn*, Mr. *Camden* ſays, " There was a " *Walnut-tree* (which by the marginal Notes, that Mr. *Gibſon* " has added to *Camden*, I find) grew in the holy Church-" yard, near St. *Joſeph*'s Chapel. This Tree, they ſay, never " budded forth before the Feaſt of St. *Barnabas*, which is on the " Eleventh of *June*, and on that very Day ſhot out Leaves, and " flouriſhed then as much as others of that Kind. Mr. *Broughton* ſays, the Stock was remaining ſtill alive in his Time, with " a few ſmall Branches, when he ſaw it, being too ſmall, young " and tender to bring forth Fruit, or ſuſtain their Weight; but " now this Tree is likewiſe gone; yet there is a young Tree " planted in its Place, (as I find, by Mr. *Gibſon*'s above cited " marginal Notes) but whether it blows as the old one did, or " whether, indeed, it was raiſed from the old one, I cannot tell. " Doctor *James Montague*, Biſhop of *Bath* and *Wells*, in King " *James* the Firſt's Days, was ſo wonderfully taken with the " Extraordinarineſs of the *Holy Thorn* and this *Walnut-tree*, " that he thought a Branch of theſe Trees was a Preſent worthy " the Acceptance of the then Queen *Anne*, King *James* the " Firſt's Conſort. *Fuller*, indeed, ridicules the *Holy Thorn*; " but he is ſeverely reproved for it by Dr. *Heylin*, another Pro-" teſtant Writer, who ſays, he had heard from Perſons of great " Worth and Credit, dwelling near the Place, that it had bud-" ded and blowed upon *Chriſtmas-day*, as we have above aſ-" ſerted."

To this Account of Mr. *Hearne* the Antiquarian, it may not be improper, we think, to inſert in this Place, a curſory Obſervation or two extracted from other Authors, in regard to its Origin and Time of Blowing.

"As to the *Haw-thorne* in the Church-yard upon the Hill, "(ſays Mr. *Whatley*, in his *England's Gazetteer*) ſaid to have "firſt taken Root from a Staff, ſtuck in the Ground by *Joſeph* "of *Arimathea*, and to bloſſom on *Chriſtmas-day* only of all the "Days in the Year, it is very dubious whether that *Joſeph* was "ever in *Britain*; and though it be certain, that there was a "*Haw-thorn-tree* in the Abbey-Church-yard, and that it was cut "down in the Time of the Civil Wars; yet it is falſe, that the "Branches of it, which were ſaved and planted in the Neigh-"bourhood, bud *always*, or *only* upon *Chriſtmas-day*; for they "bloſſom ſometimes three or four Days after, and ſeldom ſo "ſoon as *Chriſtmas-day*, unleſs the Weather be exceeding mild. "The only Manufacture at *Glaſtonbury* is Stockings; but the "chief Support of the Place is the vaſt Concourſe of People who "reſort thither to ſee the Curioſities of the Hill we have been "ſpeaking of ſo long."

To the preceding Remarks on the *Haw-thorn* and the *Walnut-tree* before mentioned, we ſhall here add Mr. *Camden*'s curſory Thoughts on them, and then quit the Subject.

"I ſhall be reckoned among the Credulous of our Age, if I "ſpeak any thing of the *Walnut-tree* here, (ſays Mr. *Camden*) "ſpeaking of the Church-yard on the Hill before mentioned, "which never budded before the *Feaſt* of St. *Barnabas*, and "on that very *Feaſt-day* ſhot out Leaves in great Abundance: "or of the *Haw-thorn-tree*, which budded on *Chriſtmas-*"*day*, as if it were in *May*; and yet (if Men may be truſt-"ed) theſe Things are affirmed by ſeveral credible Perſons. "Tho' (ſays Dr. *Gibſon*, on *Camden*) the *Haw-thorn-tree* has "been cut down theſe many Years, yet there are ſome ſtill "growing in the County from Branches of that; as particular-"ly one in the Garden of Mr. *Stroud*, the Poſſeſſor of the Ground "where the other ſtood; and another in a Garden, now be-"longing to an Inn there. Mr. *Ray* thinks the former of theſe "is what is commonly called *Nux Sancti Johannis*, which ſhoots "about *Midſummer*, or the *Nativity* of St. *John* the *Baptiſt*, but "twelve Days after the *Feaſt* of St. *Barnabas*; and that the lat-"ter, or the *Haw-thorn*, ſo much talked of at this Place, differs "but accidentally from the *Frutex*, commonly ſo called; aſcri-"bing this ſingular Effect either to Chance or Art."

To what has been already ſaid in regard to the natural Fertility of this Place, and the ſeveral other Curioſities above particularly mentioned, we might, doubtleſs, add here with Propriety enough a ſuccinct Account of the Properties and Uſes of thoſe Mineral Waters for which this Iſland is peculiarly famous, and the Merit whereof is undoubtedly very great in many particular Caſes; but as there are divers other Places in the County of *Somerſet*, that bear an equal at leaſt, if not a ſuperior Character to *Glaſtonbury*, for the happy Effects of their Mineral Waters, we ſhall reſerve that Subject for the Concluſion of the Hiſtory of this County, where we ſhall put together in a conciſe Manner whatever the moſt judicious Phyſicians have publiſhed in Favour of one Water above another.

As the three Rivers meet a little below *Glaſtonbury*, they make a Fen, and afterwards diſcharging themſelves together at one Mouth run Weſtward in one Channel to the Æſtuary of *Uzella*; and then through that fenny ſpacious Tract, called *Brent-marſh*, called by the Monks of *Glaſtonbury* a *Country of Fen-frogs*, and its little Town *Brentknol*, a *little Hill of Frogs*.

From thence to the Eaſt, *Mendippe Hills* run out a great Way both in Length and Breadth. *Leland* calls them *Minerary Hills*, and *Camden* thinks that Appellation no ways amiſs, ſince in old Records they are named *Muneduppe*; abounding with Lead-Mines, and affording very good Paſture; in which Mines any *Engliſhman* may freely work, except he has forfeited his Right by ſtealing either any of the Ore, or any of the Working-tools of his Fellow-Labourers.

There is Lead alſo dug on *Broadwell-down*, and the Parts adjacent. About the Weſt End of *Mendippe Hills* is found Plenty of *Lapis Calaminaris*, lying near the Surface of the Earth. It is of ſeveral Colours, ſome white, ſome inclining to red, ſome grey and ſome blackiſh; which laſt is accounted the beſt, and when this is broken, it is of ſeveral Colours. The *Strata*, or Courſes of *Lapis Calaminaris*, or *Calamine*, run between the Rocks generally wider than thoſe of Lead-Ore, except they are incloſed in very hard Cliffs, and then they are as narrow as the Veins of Lead*. Here are alſo ſome Veins of *Magneſia*, or *Mangoneſſe*, and alſo ſome of yellow Oker.

A

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* Philoſophical Tranſactions. *Numb.* 198.

A Deſcription of Okey-Hole.

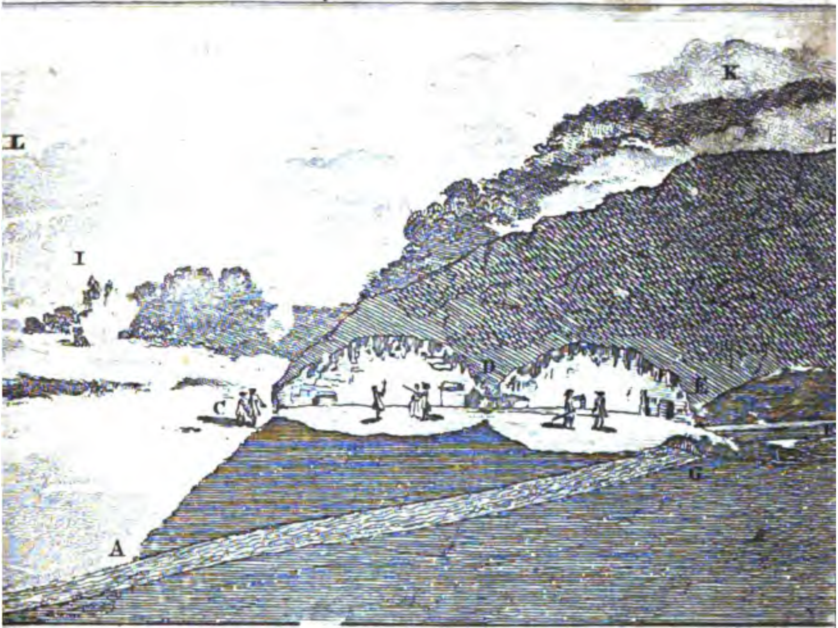
ABout two Miles from *Wells*, in the lower Part of this Ridge of Mountains, on the South Side, is the famous tripple *Grotto*, call'd *Ochie-Hole*, or *Wockey*, but more commonly *Okey-Hole*; it is the moſt celebrated ſubterraneous Cavern in the Weſt of *England*, and much reſorted to by Strangers. You aſcend the Hill about 30 Yards to the Cave's Mouth, by which there lies a huge Stone of an irregular Figure. The Entrance is about 15 or 20 Feet, and not very narrow; it opens into a very large Cavern or Vault, like the Body of a Cathedral Church; the upper Parts of which are very craggy, and abound with pendant Rocks, which ſtrike Terror into a timorous Spectator, eſpecially as they appear by Candle-light, by which they may be very plainly ſeen, contrary to what *Camden* aſſerts, by which it is plain he was never there. From all Parts of the Roof there is a conſtant Dripping of a clear Water, which however contain a great Quantity of lapideſcent Particles, ſince from theſe Drippings ariſe ſeveral ſtony Cones, which about 20 Years ago we obſerved added greatly to the Pleaſure of ſuch a gloomy View. The Bottom of this firſt Vault on which you walk is extremely rough, ſlippery, and rocky, abounding with irregular Baſons of Water; but there are now none of thoſe Cones, which about ten or twelve Years ago were cut away, and preſented to Mr. *Pope* for his *artificial Grotto*, greatly to the Diſadvantage of this natural Grotto, their native and proper Place.

From the firſt you proceed, on a gradual Deſcent, thro' a very narrow and uneven Paſſage, into another large vaulted Cavern not altogether ſo high, but nearly as wide and long, and in other Reſpects much like the firſt; from this you paſs thro' a long, low and rocky Paſſage into a third Vault, with a cylindric Roof and on one Side a fine ſandy Bottom to walk on, about fifteen or twenty Feet wide; and on the other is a Stream or Rivulet of Water, extremely clear and cold, about eight or ten Feet wide and two or three deep. Mr. *Beaumont* ſays, this River within the Cave is ſtored with *Eels*, and has ſome *Trout* in it; if ſo, they will puzzle a Naturaliſt to account for their Generation or Manner of coming there, ſince this River, after its Courſe thro the Rock, deſcends forty or fifty Feet to the level Ground, where it drives a Paper-Mill at a ſmall Diſtance from the Foot of the Hill. Indeed at a Public Houſe juſt by, they ſhew the Draught of a very large *Trout* taken out of the ſame River. Mr. *Camden* ſays, *'Tis probable this River firſt diſcharged itſelf thro' the preſent Mouth of the Cave*; which is another plain Proof that he had never been into it; ſince the Cave's Mouth lies much above the Level of this Water-courſe. It does not riſe up perpendicularly, but ſeems to come in an horizontal Courſe from the interior Parts of the Hill. This is the firſt Riſe or Source of the River *Ax*. We found, by Experiment, that the loudeſt Noiſe twenty People could make in theſe hollow Caverns, was not in the leaſt audible to thoſe who were on the Out-ſide of the Hill over us. The Air of this Cave is very cold and damp. That the Reader may have a better Idea of the Place, we have given a View of it from one End to the other in a ſuppoſed perpendicular Section of the Hill, thro' the Middle of theſe Caverns.—— Where

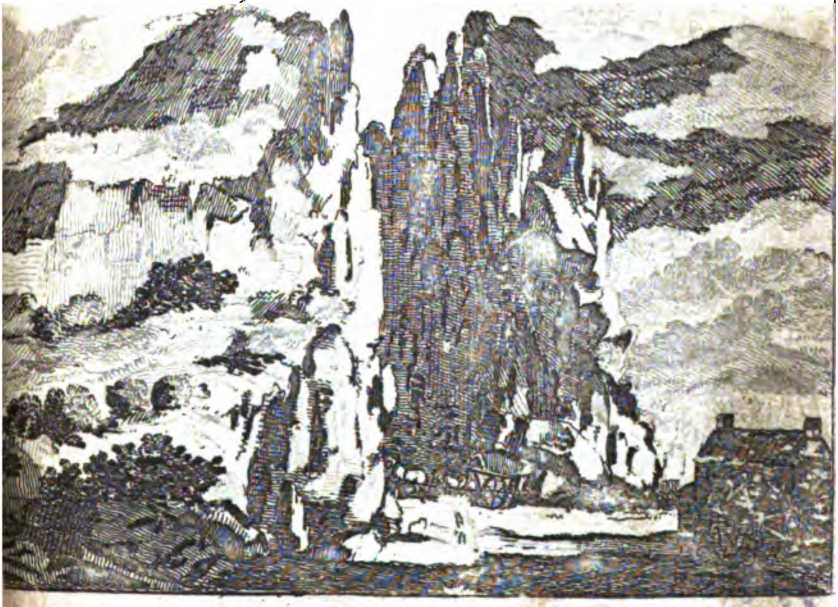
AB is Part of the Hill; C the Cave's Mouth; CD the firſt *Antrum*, or Vault; DE the ſecond; EF the third and laſt; where F is the Hole thro' which the Stream comes and runs thro' the Rock from G to A; from whence it deſcends to the Paper-Mill at H; at I is the City of *Wells*; and KL the Top of *Mendippe-Hills*.

About five Miles North-Weſt of *Okey-Hole*, on the ſame Side of *Mendippe*, lies *Cheddar*, a Village famous on two Accounts; the firſt is in regard to the Cheeſe made there, which beyond all Doubt excels, in high Reliſh and delicate Flavour, all other Sort of Cheeſe we have met with; that of *Membery* in *Devonſhire* is exceeding good, and alſo the *Double Glouceſter*, but neither comparable to the *Cheddar Cheeſe* when kept to a proper Age; nay, it is allow'd to be equal to, if not to excel even the *Parmaſan*. In an adjacent Village, alſo, called *Mare*, is made a large thick Cheeſe of an admirable fine Taſte, uſually bought up for Preſents, &c.

But what makes *Cheddar* of greateſt Note, is the *ſtupendious Chaſm*, or *Cleft* quite thro' the Body of *Mendippe-Hill*, near this Place. It looks as if the Hill had been ſplit in ſunder by the Shock of an Earthquake; we walk'd about a Quarter of a Mile in the Clift, A VIEW of OKEY HOLE.



A VIEW of CHEDDAR CLIFFS.



INSTITUTIONS OF ARITHMETIC.

The Introduction.

1. MATHESIS is the Science or Doctrine of *Quantity*, whoſe various Relations and Affections it contemplates, and gives Rules for making an *Eſtimate*, or *Computation* thereof; which it expreſſes in different Ways, and by various kinds of Symbols or Characters, which is called *Notation.*

2. *Quantity* is every thing which we can conceive to have any Magnitude or Parts, or, properly ſpeaking, it is any thing concerning which we can aſk the Queſtion, *how much?* Or, *how great?* It is often diſtinguiſhed into *continued* and *diſcrete.*

3. *Continued Quantity* is that whoſe Parts are all contiguous, or adhere together, and make but *one Whole*, as a *Shilling*, a *Stone*, a *Sheep*, &c. this is the Subject of that Part of *Matheſis* which is called *Geometry*.

4. *Diſcrete Quantity* is that whoſe Parts are not contiguous, but ſeparate from each other, and make what Logicians call a *collective Idea*, or *Whole*; thus *one Pound* conſiſts of 20 *Shillings*; a *Flock* of many Sheep, *&c.* this is the Subject of the other Part of Matheſis called *Arithmetic.*

5. Notation is of three Kinds, *viz. Numerical, Specious* and *Linear*; *Numerical Notation* is the Repreſentation of Quantity or Quantities by thoſe Characters we call *Numbers* or *Digits*, which are in all Ten, *viz.* 0, Cypher; 1, One; 2, Two; 3, Three; 4, Four; 5, Five; 6, Six; 7, Seven; 8, Eight; 9, Nine. Theſe are uſed in common Arithmetic.

6. *Specious Notation*, is that wherein *Species*, or *Letters* are made uſe of to repreſent Quantities, as the Letters of the Alphabet, *a*, *b*, *c*, or *A*, *B*, *C*, *&c.* as in *Algebra*. Or the ſame Letters with Points over them, thus, $\dot{x}$, $\dot{y}$, $\dot{z}$, in that Part of the Science called *Fluxions*.

7. *Linear Notation*, is the Repreſentation of Quantities by *Lines*, and *Figures* compoſed of *Lines*, as is done in all the Parts of *common Geometry*.

8. The Quantities conſidered in *Arithmetic* are called *Numbers*, of which there are two Sorts, *whole* and *broken*, which are otherwiſe called *Integers* and *Fractions*. The leaſt whole Number is *Unity*, or 1 One; that is, any *one Thing* is called an *Unite*; and *Nothing*, or *Nullity* is repreſented by the Cypher 0.

9. A Number of Units under Ten, is repreſented by a ſingle Digit, as 2, 5, 7, *&c*, but *ten Units* are deſigned by the firſt Digit 1, with a Cypher annexed to the right Hand, thus, 10. And as an Unit is made Ten by one Cypher annexed, ſo it is made *Ten times Ten*, or an *Hundred*, by two annexed Cyphers, *viz.* 100; ſo another Cypher makes *Ten Hundred*, or *One Thouſand*, *viz.* 1000, and ſo on as in the following Table,

1	Unit
10	Ten
100	Hundred
1000	Thouſand
10000	Ten Thouſands
100000	Hundred Thouſands
1000000	Million
10000000	Ten Millions
100000000	Hundred Millions
1000000000	Thouſand Millions.

10. If the Number conſiſts not of even Tens, then ſuch a Digit is annexed to the Unit as will expreſs the ſaid Number; thus Seventeen is expreſſed by 17. Alſo *twice Ten*, or *Twenty*, is expreſſed by the Figure 2 and a Cypher, thus, 20; and *Thirty* by 30; *Forty* by 40; and ſo on to an Hundred. The intermediate Numbers are alſo expreſſed by annexing proper Digits in the Place of the Cypher; thus 25 is Twenty-five; 37 Thirty-ſeven, *&c.*

11. From hence we obtain the Method of *Enumeration*, or expreſſing the Number of Quantities contained in any given *Sum*, as ſhewn below.

NUMERATION TABLE.

Hundred of Millions	Tens of Millions	Millions	Hund. of Thouſ.	Tens of Thouſ.	Thouſands	Hundreds	Tens	Units	
								1	One
							2	1	Twenty-one
						3	2	1	Three Hundred, Twenty-one
					4	3	2	1	4 Thouſand, 3 Hundred, 21
				5	4	3	2	1	54 Thouſand, 3 Hundred, 21
			6	5	4	3	2	1	6 Hundred, 54 Thouſand, 3 Hundred 21
		7	6	5	4	3	2	1	Seven Million, 654 Thouſand, 321
	8	7	6	5	4	3	2	1	87 Million, 654 Thouſand, 321
9	8	7	6	5	4	3	2	1	987 Million, 654 Thouſand, 321.

Here it is plain, that in order to numerate the Figures in any Sum, you have only need to mention firſt each Figure, and then the Place in which it ſtands, according to its Name of Valuation in the Table, in the ſame Manner as you ſee done for each Sum, or Line of Figures in the Table on the Right-hand Side. Thus for Inſtance, the Sum 850943 you read or value thus, 8 Hundred, 50 Thouſand, 9 Hundred, 43; or thus at twice, 850 Thouſand, 943; and ſo the Sum 406528035 is thus read, 406 Million, 528 Thouſand, 35; and ſo of others.

12. As an Unit may have its Value encreaſed ten Times, by annexing a Cypher to the Right-hand, ſo its Value is diminiſhed in a *ten-fold Proportion* by prefixing Cyphers thereto; thus

0,1 is one Tenth
0,01 is one Hundreth } of an Unit.
0,001 is one Thouſandth

Thus alſo { 0,7 is Seven Tenths
0,53 is Fifty-three Hundredths } of an Unit.
0,375 is Three Hundred Seventy-five Thouſandths

13. In this Caſe, the Cypher on the Left-hand, cut off with a Comma (,) ſtands in the Unit's Place, and ſhews the Number does not amount to Unity, but is a certain Number of ſuch Parts as the Unit contains 10, or 100, or 1000, &c. and theſe Parts are

expreſſed by the Figures on the Right-hand of the Comma. This kind of Notation of the Parts of a broken or divided Unit is called *Decimal*, (from *Decem*, Ten) and thoſe Parts of Unity are called *Decimal Numbers* or *Decimal Fractions*.

14. Sometimes a Number conſiſts of *Integers* and *Decimals* together, and is then called a *mix'd Number*; thus 7,3 is Seven and three Tenths; 84,53 is Eighty-four and Fifty-three hundredth Parts of another; and ſo of others. That Part of the Science which treats of theſe Numbers is called *Decimal Arithmetic*.

15. If Unity be divided in any other than a *ten-fold Proportion*, then another Species of Computation will enſue; thus in Aſtronomy we divide a Degree into 60 equal Parts or Minutes; theſe Minutes are each divided into 60 *Seconds*; each Second into 60 *Thirds*; and ſo on to *Fourths*, *Fifths*, &c. And they are thus denoted, *viz.* $35^\circ : 47' : 31'' : 23'''$; *Thirty-five Degrees*, *Forty-ſeven Minutes*, *Thirty-one Seconds*, *Twenty-three Thirds*. The Rules for managing theſe Numbers is called *Sexagenary* or *Sexageſſimal Arithmetic*.

16. It frequently happens that we are obliged to divide an Unit indefinitely, or into any Number of Parts as Occaſion requires for comparing a Part with the whole Unit, in Parts of ſuch a Diviſion: In this Caſe, the Way to expreſs ſuch a Fraction, is to place the Unit divided into its whole Number of Parts, below a Line, and the Parts of the Unit which are given, above it; thus $\frac{3}{4}$ is three Parts of ſuch as the Unit contains Four of; and $\frac{5}{13}$ is five Thirteenths of the whole Unit. Theſe are called *Vulgar Fractions*.

17. A Vulgar Fraction is ſaid to be *pure*, when it conſiſts only of fractional Parts, as $\frac{1}{2}$, $\frac{13}{43}$, $\frac{234}{751}$, &c. and *mixed*, when joined with Integers, as $5\frac{1}{7}$, $23\frac{4}{9}$, $1\frac{16}{751}$, &c.

18. The Number placed below the Line, is called the *Denominator* of the Fraction, becauſe it denominates the Fraction, or Number of Parts into which Unity is broken or divided; and the Number above the Line is called the *Numerator*, becauſe it enumerates or ſhews how many of thoſe Parts make the Fraction propoſed.

19. The Fraction is ſaid to be *proper*, when the Numerator is leſs than the Denominator, as $\frac{3}{4}$; but *improper*, when the Contrary happens; as $\frac{4}{3}$, $\frac{13}{9}$, &c.

20. When any two Quantities are compared together, to obſerve the Relation of their *Magnitude*, ſuch Compariſon is called *a Ratio*; and is thus expreſſed, a : b; of this Ratio, the firſt Term (a) is called the *Antecedent*, and the latter (b), the *Conſequent*.

21 When any two Quantities have the ſame Ratio with any other two, it is denoted by this Character ::, thus a : b :: c : d; the Quantity (a) is to (b) as (c) is to (d); which are therefore ſaid to be *analogous* or *proportionate*; and ſuch a Compariſon, or Expreſſion, is call'd *Analogy* or *Proportion*.

22. When any Calculation is to be made, it is done either by *Addition*, *Subſtraction*, *Multiplication* or *Diviſion* of Quantities; which four fundamental Rules are called the *Algorithm* of Quantities, and which we now proceed to explain.

Characters for Abbreviation explained,

viz.	+	signifies	More; as $3+4$, is 3 added to 4
	—		Leſs; as $4-3$, is 3 taken from 4
	×		Multiplied by; as 3×4, is 3 multiplied by 4
	÷		Divided by; as $3\div4$, is 3 divided by 4, or $\frac{3}{4}$
	=		Equal to; as $a=4$, is a equal to 4.

CHAPTER I.

ADDITION of INTEGERS, or WHOLE NUMBERS.

23. ADDITION of Numbers conſiſts in adding together all the Units contained in ſeveral particular Numbers, properly diſpoſed, into one *Sum*, *Aggregate*, or *Total*, expreſſing the Value of all together. And this is performed in the following Manner, *viz.*

24. Let the ſeveral particular Sums, or Numbers, be diſpoſed one under another, in ſuch a Manner, that the Place of Units, Tens, Hundreds, *&c.* in each, may conſtitute a perpendicular Column of Figures; thus, let it be required to add together the Numbers 57, 762, 5389, 97615; in order to do this they muſt firſt be diſpoſed thus,

$$\begin{array}{r}57\\762\\5389\\97615\\ \hline\end{array}$$

25 The Numbers placed, as above, you proceed to add together by the following

RULE,

Reckon up all the Digits in the firſt, or Right-hand, Column, and obſerve, for every Ten to carry One to the Place of Tens in the ſecond Column, ſetting down the remaining Digits under the firſt Column of Units: Thus, $5+9+2+7=23$, which is thus expreſſed, five more nine is fourteen, and two is ſixteen, and ſeven is twenty-three or 23, in which Sum there are *two Tens* and 3 over; you muſt then ſet down the 3 and carry Two to the next Place of Tens, and proceed as before; thus, $2+1+8+6+5=22$; here again are *two Tens*, and Two over to be ſet down under the ſecond Column; then carrying the Two to the third Column of Hundreds, you ſay again, $2+6+3+7=18$; here is but *one Ten*, and 8 to be ſet down; then carrying One to the next Column, ſay $1+7+5=13$; here again is *one Ten*, and 3 to be ſet down; laſtly, carry One to the laſt Place, and ſay $1+9=10$, which Number, be it what it will, is always ſet down, and the Sum total is compleat in one Number, as in the Examples.

57	6475
762	9830
5389	2764
97615	5937
103823	25006

26. The Reaſon why you carry *Ten* from every Column to the next, is becauſe the Value of the Figures in each Column encreaſes in a ten-fold Proportion, as is evident from Article 9; and the Digits ſet down under each Column are *Units*, *Tens*, *Hundreds*, *Thouſands*, *&c.* according to Inſt. 11. which will expreſs the Value of all the Columns ſeverally collected and added together. Thus in the firſt Example, the Sums of each Column will ſtand thus, *viz.*

23	Column of Tens
200	——— of Hundreds
1600	——— of Thouſands
12000	——— of Ten Thouſands
90000	——— of Hundred Thouſands.
103823	= Total Value.

27. More Examples of Addition are the following:

5729	5009	847593
43605	120	215475
9834	369	176843
30546	1298	467890
75102	57306	150362
164816	64102	1858163

28. In the Addition of ſeveral Sums of *Money*, *Meaſure*, *Weight*, *&c.* you obſerve one general Rule, *viz.* *to collect all the Units of one Species together; and then for every Number of thoſe Units, which make one of the next Species, you add One to the next Column, ſetting down the Remainder, as above.* In Money the Species are thus denoted,

viz.	*f.*	for	Farthings	of which	4=1 Penny.
	d.		Pence		12=1 Shilling.
	s.		Shillings		20=1 Pound.
	L.		Pounds		

Thus in the following Example, for every 4 Farthings you carry one Penny to the Column of Pence; for every 12 Pence you carry One to the Column of Shillings, and from thence, for every Twenty, you carry one to the Place of Pounds; which are added as the Integers in Inſt. 27.

Example.

	l.	*s.*	*d.*	*f.*
	37	12	9	3
	125	7	10	2
	750	16	7	1
Total £.	913	17	3	2

29. I ſhall here ſubjoin ſeveral Sums to be added for the Learner's Practice.

l.	*s.*	*d.*	*f.*	*l.*	*s.*	*d.*	*f.*
175	19	6	2	3758	17	11	2
386	18	10	3	279	16	10	3
57	19	4	1	46	8	9	1
6	12	5	2	8	19	7	2

l.	*s.*	*d.*	*f.*
10	16	10	2
175	18	9	0
37	14	11	2
956	16	10	1
47	19	9	3

l.	*s.*	*d.*	*f.*
1000	16	10	2
100	10	11	3
90	2	3	2
10	12	10	1
9	17	5	1
0	17	4	0

30. Of *Weights* we have ſeveral Sorts, *viz.*

I. Troy Weight.

In which
24 Grains (*Grs.*) make 1 Penny Weight.
20 Penny Wts. (*Pwt.*) 1 Ounce.
12 Ounces (*oz.*) —— 1 Pound. (*lb.*)

31. II. Apothecaries Weight.

In which
20 Grains (*Grs.*) make 1 Scruple.
3 Scruples (℈) —— 1 Dram.
8 Drams (ʒ) —— 1 Ounce.
12 Ounces (℥) — — 1 Pound (*lb.*)

32. III. Avoirdupois Weight.

In which
16 Drams (*Drs.*) make 1 Ounce.
16 Ounces (*Oz.*) —— 1 Pound.
28 Pounds (*lb.*) — — 1 Quarter of an Hundred.
4 Quarters (*Qrs.*) — 1 Hundred Weight.
20 Hundred (*C.*) — 1 Ton.

33. In each of theſe Species the Learner may exerciſe himſelf by the following Examples, *viz.*

In Troy Weight.

lb.	*Oz.*	*Pwt.*	*Grs.*
21	11	17	21
20	9	15	7
8	4	3	23
19	10	19	18

In Apothecaries Weight.

lb.	℥.	ʒ.	℈.	*Grs.*
18	10	7	2	16
9	11	5	0	10
16	9	4	1	10
3	5	6	2	15
25	9	0	1	6

In Avoirdupois Weight.

T.	*C.*	*Qrs.*	*lb.*	*Oz.*	*Drs.*
175	17	3	25	14	13
90	10	2	17	10	12
105	18	1	11	9	4
19	19	0	27	15	3
195	17	1	14	9	10
74	10	3	8	12	9

In Long Meaſure.

34. Our MEASURES are of divers Sorts; the Meaſures of Length are of the following ſpecies.

3 Barley Corns make 1 Inch.
12 Inches — — — 1 Foot.
3 Feet — — — 1 Yard.
5½ Yards — — 1 Rod.
40 Rods — — — 1 Furlong.
8 Furlongs — — 1 Mile.

35. Our CORN MEASURES are the following.

2 Gallons make 1 Peck.
4 Pecks — 1 Buſhel.
8 Buſhels — 1 Quarter.
5 Quarters — 1 Load.

36. Our LIQUID MEASURES are of the following Species, *viz.*

8 Pints make 1 Gallon.
9 Gallons — 1 Firkin of Bear.
8 Gallons — Ditto of Ale.
2 Firkins — 1 Kilderkin.
2 Kilderkins 1 Barrel.
2 Barrels — 1 Hogſhead.

37. But our WINE MEASURE is as follows, *viz.*

8 Pints make 1 Gallon.
63 Gallons — 1 Hogſhead.
2 Hogſheads 1 Pipe, or Butt.
2 Butts — 1 Tun.

38. The true original Standard for Meaſures of Capacity or Solidity, is the CUBIC INCH.

Thus 282 Cubic Inches make 1 Ale Gallon.
231 Cubic Inches make 1 Wine Gallon.
268¾ Cubic Inches make 1 Corn Gallon.

Alſo 1728 Cubic Inches make one Foot Solid.

39. Our Meaſures of TIME are of the following Denominations, *viz.*

60 Seconds make 1 Minute.
60 Minutes — 1 Hour.
24 Hours — 1 Day.
7 Days — 1 Week.
4 Weeks — 1 Month.
13 Months — 1 Year.

40. A CIRCLE, and alſo the MOTION performed in a Circle, (eſpecially in reſpect of the ECLIPTIC in aſtronomical Affairs) is divided in the following Manner, *viz.*

60 Seconds make 1 Minute.
60 Minutes — 1 Degree.
30 Degrees — 1 Sign.
12 Signs, or 360 Degrees } — The Circle.

In very nice Matters we ſub-divide a Second into 60 Thirds; a Third into 60 Fourths, and ſo on; as mentioned, Inſt. 15.

41. I ſhall ſubjoin the following Example for Practice.

Long Meaſure.

M.	*F.*	*Rds.*	*Yds.*	*F.*
175	5	36	3	2
19	3	27	5	1
76	7	39	4	0
121	0	20	2	1
54	6	17	4	0

M.	*F.*	*Rds.*	*Yds.*	*F.*	*In.*
195	3	27	3	1	10
79	7	30	4	0	11
9	6	29	5	2	9
17	5	20	4	0	7
59	4	18	0	1	6

Time.

Y.	*M.*	*W.*	*D.*	*H.*
175	9	3	2	17
140	12	1	5	21
35	7	0	6	19
9	5	2	4	11
110	10	1	3	8

Y.	*M.*	*W.*	*D.*	*H.*	′	″
143	10	2	5	19	50	37
74	9	3	6	20	7	57
3	4	0	3	1	39	10
19	3	1	2	5	25	41
158	12	2	0	22	30	8

Motion.

Rev.	*Sg.*	*Dr.*	′	″	*Rev.*	*Sg.*	*Dr.*	′	″
175	10	28	51	42	237	11	22	50	40
74	11	17	41	37	41	10	20	9	30
50	9	21	30	58	17	9	17	17	27
9	8	11	35	53	573	5	9	27	35
5	10	5	10	9	29	8	10	15	42
3	5	13	7	16	17	3	8	16	51

42. The beſt Way to know if the Sum be caſt up right, is to do it twice over, beginning at the Bottom, and reckoning upwards the firſt Time; and then beginning at the Top, and reckoning downwards the ſecond Time; and if the *Sum Total* in both Caſes be the ſame, the Work is right, otherwiſe not.

CHAP. II.

SUBTRACTION of INTEGERS.

43. SUBTRACTION is the ſecond Operation in the Art of *Computation*; it conſiſts in finding the Difference between two Numbers, *by taking the Leſſer from the Greater*; and as this is the Reverſe of Addition, ſo the Rule of performing it, is the Contrary of that, *viz.*

RULE.

44. *From each Figure in the upper Line (beginning at the Right Hand) take the Figure in the under Line, if it be leſs, and ſet down the Difference, but if the Figure or Number in the lower Line exceeds that in the upper One which ſtands over it, encreaſe that upper Figure by adding* 10, *if it be in the Place of Integers; but if it be in any Species of Money, Weight, Meaſure,* &c. *you add to it ſuch a Number as makes One of the next Denomination, and then ſubtract as before, and ſet down the Difference, and remember, that every Time you thus encreaſe the upper Figure, you carry* one Unit *to the next Figure in the lower Line.*

45. This Rule will be beſt illuſtrated by the following Examples.

From	57238765	695278675
Take	13106243	434865740
Remains	44132522	260412935

5729438640	1097654320 16
178089305	16741320785

Money.

l.	*s.*	*d.*
175	17	9
94	13	6
81	04	3

l.	*s.*	*d.*	*f.*
17653	05	11	3
589	17	10	2
17063	08	01	1

l.	*s.*	*d.*	*f.*
9175	17	04	2
1049	19	10	3
81 | 25	/7	5	3

l.	*s.*	*d.*	*f.*
3729	17	10	0
3018	17	11	3

Troy Weight.

l.	*Oz.*	*Pwt.*	*Grs.*
131	10	18	14
79	11	19	20

l.	*Oz.*	*Pwt.*	*Grs.*
173	05	00	01
9	10	00	23

Avoirdupois Weight.

T.	*C.*	*Qrs.*	*lb.*	*Oz.*
35	18	2	24	0
34	19	3	25	9

T.	*C.*	*Qrs.*	*lb.*	*Oz.*	*Drs.*
13	00	0	01	00	15
10	17	2	7	09	15

Long Meaſure.

M.	*F.*	*Rds.*	*Y.*	*F.*
173	7	37	4	1
19	7	39	5	0

M.	*F.*	*Rds.*	*Yds.*	*F.*	*In.*
517	6	00	1	2	10
9	0	00	4	2	11

Motion.

Rev.	*Sg.*	*Dr.*	′
15	07	20	40
14	11	29	50

X *Rev.*	*Sg.*	*Dr.*	′	″
10	9	29	59	00
8	10	29	00	59

X see The [illegible] explained Pag 80. [illegible]

Time.

Y.	*M.*	*W.*	*D.*	*H.*
157	10	0	6	21
25	12	2	1	23

Y.	*M.*	*W.*	*D.*	*H.*	′	″
125	[illegible]	0	0	00	00	01
124	11	3	6	23	59	09

46. Theſe Examples well underſtood, all others of every Sort will be eaſy; and the Reader needs not be told, that the Difference added to the lower Line, or leſſer Number, ought to make the Sum in the upper Line, and will, when the Work is right.

CHAP. III.

MULTIPLICATION of INTEGERS.

47. MULTIPLICATION is the *third Operation* in Arithmetic, and is nothing more than a compendious Way of adding any Number or Sum, any Number of Times to its ſelf. Thus if the Number 135 be added 3 Times to its ſelf, the Sum will be the ſame as the Product of 135 multiplied by 3, as it evident below, *viz.*

Add 135
135
135

Sum 405

Multiply 135
By 3

Product 405

48. If the ſame Number 135 were to be made 13 Times as great, then you make it firſt, 3 Times as great, *viz.* 405; and after that, 10 Times as great (which is done by annexing a Cypher to the right Hand, Inſt. 9.) *viz.* 1350, and then the Sum of both theſe is that required, *viz.*

The Factors 135 The Multiplicand.
13 The Multiplier.

1ſt Sum 405
2d Sum 1350

Total 1755 Product.

49. But that a Perſon may be ready at inveſtigating theſe particular Sums, it is abſolutely neceſſary to learn the following Table by heart.

The Multiplication Table.

3 Times	3 is	9	4 Times	4 is	16
	4	12		5	20
	5	15		6	24
	6	18		7	28
	7	21		8	32
	8	24		9	36
	9	27			
5 Times	5 is	25	6 Times	6 is	36
	6	30		7	42
	7	35		8	48
	8	40		9	54
	9	45			
7 Times	7 is	49	8 Times	8 is	64
	8	56		9	72
	9	63	9 Times	9	81

50. By this Table we find the Sum which ariſes by adding any Digit any Number of Times (under 10) to its ſelf; thus 8 added 7 Times to its ſelf makes 56, and therefore we ſay, 7 Times 8 is 56; and ſo of others. The Learner will take Notice, that 7 Times 5 is the ſame as 5 Times 7, and therefore, it was not neceſſary to make the Table any larger.

51. Having this Table perfectly in Mind, the Operation will be eaſy by the following

RULE.

With the firſt Figure to the Right Hand, in the Multiplier, begin to multiply each Figure in the Multiplicand, proceeding from the Right to the Left; in the Product of each Figure, ſet down the Digits under 10, *or between the Tens; and for every* 10 *contained in ſuch Product, carry One to the next Place. In like Manner proceed with every Figure of the Multiplier; and ſet down the ſeveral Products, one under another, in ſuch a Manner that they may ſtand one Figure backwards, or the firſt Figure of each Line under the ſecond Figure of that above; then add all into one Sum, which will be the Product, as in the following*

Examples.

Mult.	1735	5738	4897
by	4	16	384
	6940	34428	19588
		5738	39176
		91808	14691
			1880448

52. The Reaſon of the laſt Part of the Rule, *viz.* ſetting the ſeveral Products one Figure back will eaſily appear from Inſt. 48. Becauſe the Cyphers annexed to each Product are here rejected as making no Alteration in the Value of the Product, when thus reckoned up. Thus, in the laſt Example, the Multiplicand 4897, being multiplied by 4, 80, 300, ſucceſſively, makes the Products, 19588, 391760, 1469100, which, added together, make the ſame Number as before; as is evident below

```
   4897
    384
  -----
  19588
 391760   } Here the three Cyphers being rejected, as ſuper-
1469100   }    fluous, the Reſt ſtands as before.
-------
1880448
-------
```

53. If a Cypher be found in the Multiplier, you place a Cypher under it, or annex it to the firſt Figure of the next Product; or you ſet the next Figure two Places back inſtead of one. Thus 1795 multiplied by 307 will ſtand

```
thus;  1795     or thus;  1795     or thus;  1795
        307                307                307
       ----               ----               ----
      12565              12565              12565
      0000              53850              5385
     5385               ------             ------
     ------             551065             551065
     551065             ------             ------
     ------
```

The laſt Way is moſt compendious, but the 2d is eaſieſt for a Learner, and is generally uſed; the Reaſon of both appears from the firſt Poſition of the Product; for it is evident the 4 Figures 1795 multiplied by 0, gives 4 Places of Cyphers, which are of no uſe to ſet down.

54. I ſhall here ſubjoin a Variety of Examples for the Learner's Obſervation and Exerciſe, both wrought and unwrought, as follow:

```
  1750         7580          80507
    76          520           3050
 ------      -------      ---------
  10500       151600        4025350
 12250        37900       2415210
 ------      -------      ---------
 133000      3941600      245546350
 ------      -------      ---------
```

756940
10090

68124600
75694000

7637524600

705059
1000

705059000

579603
10001

579603
579603000

5796609603

1001000
1010

10010000
10010000

1011010000

89704500
605730

900203005
90107004

57986000
18000500

100100010
10010010

55. The vulgar Method of proving the Truth of the Work, is by adding together the Digits in the Multiplicand and Multiplier, and caſting out every *Nine*, as often as it occurs, noting the Remainders; then multiplying the Remainders, and caſting the Nines out of the Product, you note the Remainder in that Caſe: Laſtly, the Nines are caſt out of the Sum of the Digits in the Product, and if the Remainder, in this Caſe, be the ſame with the laſt mentioned, it is a general Proof that the Work is true. Thus in the firſt Example of Inſt. 54, the two firſt Remainders are 4 and 4; the Remainder in their Product is 7, which is alſo the Remainder in the whole Product of the Factors, and ſhews the Work is right. But the genuine Proof of Multiplication is by *Diviſion*.

56. *Compound Multiplication* is ſometimes of Uſe. This is when the *Multiplicand* conſiſts of differents Parts or Species of *Meaſure*,

Meaſure, *Weight*, *Time*, *Motion*, &c. As in the Examples following.

	l.	*s.*	*d.*	*lb.*	*oz.*	*pwts.*	*gr.*	*yds.*	*f.*	*in.*
Mult.	15	7	6 ½	8	11	16	10	40	2	10 ¼
By			5				8			12
	76	17	8 ½							

But when the Multiplier is large, theſe Operations are much eaſier by *Decimal Arithmetic*, as will be ſhewn farther on.

CHAP. IV.

DIVISION of INTEGERS.

[illegible] Y.
[illegible]ons to Di-
vide By
9. Page
185
Miſcel.
Corresp.

57. BY this Operation we find how often the ſmalleſt of any two given Numbers is contained in the greater, which is therefore but the Reverſe of Multiplication; as for Example, Let it be required to find how often 3 is contained in 405. Then firſt, 3 is contained in 405, 100 Times, with a Remainder of 105; in this Remainder it is contained 30 Times with another Remainder of 15, in which it is contained 5 Times; therefore in all the Parts of 405, the Number 3 is contained, 100+30+5= 135 Times, as in the Operation below. (See Inſt. 47)

Diviſor.	*Dividend.*	*Quotient.*
3)	405	(100
	300	
3)	105	(30
	90	
3)	15	(5
	15	
	..	135

58. Hence you ſee the Reaſon of the compendious Form in the common Operation of this Part of Arithmetic; which therefore is performed by the following

RULE.

RULE.

If the Diviſor be a leſs Number than ſo many Figures taken on the Left Hand in the Dividend make, ſee how often the Former is contained in the latter, and the Figure which expreſſes it, is the firſt of the Quotient; then multiply the Diviſor by the Quotient Figure, and placing the Product under the ſaid Figure or Figures of the Dividend, ſubtract it therefrom; and to the Remainder, annex the following Figure of the Dividend, which divide as before; and thus proceed 'till the whole Dividend be exhauſted; as the Examples following.

```
3 ) 405 ( 135
    3
    —
    10
     9
    —
     15
     15
     —
     ..
```

```
8 ) 9769 ( 1221
    8
    —
    17
    16
    —
     16
     16
     —
     ..9
        8
        —
        1
```

```
12 ) 1728 ( 144
     12
     —
     52
     48
     —
      48
      48
      —
      ..
```

```
135 ) 1755 ( 13
      135
      —
      405
      405
      —
      ...
```

59. If it happen that the Diviſor be a greater Number than ſo many of the firſt Figures of the Dividend make, then you take a Number of Places in the Dividend greater by one, and proceed as before, as in the following Examples.

5) 3790 (758	25) 127900 (5116
35	125
—	—
29	29
25	25
—	—
40	40
40	25
—	—
..	150
	150
	—
	...

60. If in any Caſe, the Remainder be ſo ſmall, that when the Figure of the Dividend joined with it, make a Sum leſs than the Diviſor, than a Cypher is to be placed in the Quotient, and another Figure taken down; and then the Diviſion renewed, proceeds as above. Thus

9) 1863 (207	12) 250836 (20903
18	24
—	—
..63	108
63	108
—	—
..	...36
	36
	—
	..

61. If the Diviſor be not contained a whole Number of Times in the Dividend preciſely, there will be a Remainder, when the Diviſion is finiſhed, which is to be placed Fraction-wiſe in the Quotient, together with the Diviſor, as the Denominator, as in the following Caſes.

7) 673 (96$\frac{1}{7}$	13) 12976 (998$\frac{2}{13}$
63	117
—	—
43	127
42	117
—	—
1	106
	104
	—
	2

71) 29754 ($419\frac{5}{71}$	131 (135076 ($1031\frac{15}{131}$
284	131
135	··407
71	393
644	146
639	131
··5	15

62. When the Diviſor has one or more Cyphers at the Beginning, they may be omitted in the Work, provided you ſtrike off as many Figures in the Beginning of the Dividend, which are to be annexed to the Remainder to compleat it; as will appear in the enſuing Operations.

At Length.	*Contracted.*
70) 5689 ($81\frac{19}{70}$	7|0) 568|9 ($81\frac{19}{70}$
560	56
89	··8
70	7
19	19
8300) 9850716 (1186	83|00) 98507|16 (1186
8300	83
15507	155
8300	83
72071	720
66400	664
56716	567
49800	498
6916	6916

63. Theſe are all the Varieties the Learner will meet with in this Operation; and the following Examples will exerciſe him therein.

175) 89463 (9850) 82768 (
5900) 300012 (15700) 9875830 (
1000) 980005 (60800) 908437200 (

64. To prove the Truth of the Work, multiply the Quotient by the Diviſor, and if the Product be the ſame with the Dividend, the Work is right; otherwiſe not. Note, if there be any Remainder in the Diviſion, it muſt be added to the ſaid Product to make the Proof. Thus in the laſt Example of (61) we have 1031×131=135061, and then the Remainder 15 being added, the Whole makes 135076, the ſame with the Dividend.

65. And, *vice verſâ*, the only true Proof of Multiplication is by Diviſion, as will eaſily appear to any one who underſtands the preceding Operations. Thus in the firſt Example of (54) if you divide the Product 133000 by the Multiplier 76, the Quotient will be the Multiplicand 1750, which proves the Work true.

CHAP. V.

Of VULGAR FRACTIONS.

66. TO fit Vulgar Fractions for Operation, they ſhould be firſt of all reduced to their loweſt Denomination, which is done by finding a common Diviſor by this

RULE.

Divide the Denominator by the Numerator, and the Numerator by the Remainder (if any) and that firſt Remainder by the Second, the ſecond by the Third, and ſo on, till the Remainder be nothing; as in the Inſtances following, viz. $\frac{15}{111}$, $\frac{31}{137}$.

15)

```
15 ) 81 ( 5          31 ) 157 ( 5
     75                   155
     --                   ---
      6 ) 15 ( 2               2 ) 31 ( 15
          12                       30
          --                       --
           3 ) 6 ( 2                1 ) 2 ( 2
               6                        2
               -                        -
               .                        .
```

67. The laſt Diviſor is the *common Diviſor* ſought, by which, if the Fraction be divided, it will be reduced to its loweſt Terms; thus if the Fraction $\frac{15}{81}$ be divided in each Part by 3, it is reduced to $\frac{5}{27}$, which is equal in Value to the former. And becauſe, in the ſecond Example, the Remainder is Unity, it ſhews that Fraction is already in its loweſt Denomination.

68. *Mix'd Numbers* muſt be reduced to a fractional Form, which is done by this

RULE.

Multiply the integral Part by the Denominator of the fractional Part, to which add the Numerator, and the Sum will be a new Numerator; under which write the Denominator, and it makes an improper Fraction of the ſame Value. As in theſe Examples, $5\frac{2}{7}$, $1\frac{3}{11}$, $28\frac{1}{13}$. *Thus* $5\times7=35$, *and* $35+2=37$, *then* $\frac{37}{7}=5\frac{2}{7}$; *alſo* $1\times11=11$, *and* $11+3=14$, *then* $\frac{14}{11}=1\frac{3}{11}$; *laſtly,* $28\times13=364$, *and* $364+1=365$, *then* $\frac{365}{13}=28\frac{1}{13}$. *The Reaſon of all which appears from common Diviſion* (61.)

69. Two or more Fractions are reducible to *one common Denomination*, that is, ſhall have all the ſame Denominator, retaining ſtill their firſt Values, by this general

RULE.

Multiply the Numerator of each Fraction into all the Denominators, but its own, for a new Numerator, and multiplying all the Denominators together, the Product ſhall be a common Denominator to all the Numerators before found.

Thus let it be required to reduce $\frac{2}{5}$, $\frac{7}{13}$, $\frac{17}{73}$, to one common Denomination, the Work will ſtand as below.

2	7	17	73
13	5	13	13
26	35	51	219
73	73	17	73
78	105	221	949
182	245	5	5
1898	2555	1105	4745

Then the Fractions become $\frac{1898}{4745}$, $\frac{2555}{4745}$, $\frac{1105}{4745}$, all of the ſame Value as before.

70. This previous Reduction of Fractions to a common Denominator, renders them eaſy to be added, or ſubtracted; for this is done among the Numerators only of the Fractions thus reduced; for Example, to add the two Fractions $\frac{2}{5}$ and $\frac{7}{13}$ together; theſe reduced (*per* 69) are $\frac{1898}{4745}$ and $\frac{2555}{4745}$, whence $1898+2555=4453$; conſequently $\frac{4453}{4745}=\frac{2}{5}+\frac{7}{13}$, the Sum required. Thus alſo, $\frac{2}{5}+\frac{7}{13}+\frac{17}{73}=\frac{5558}{4745}=1\frac{813}{4745}$. So any other Fractions are added together.

71. In like Manner you ſubtract one Fraction from another; thus $\frac{7}{13}-\frac{2}{5}=\frac{657}{4745}$, becauſe $2555-1898=657$. So alſo $\frac{2}{5}-\frac{17}{73}=\frac{1898-1105}{4745}=\frac{793}{4745}$. And the like of others. When Fractions are thus added or ſubtracted, the fractional Sum or Difference is to be reduced to its loweſt Denominator by the Rule of (66.)

72. To *multiply Fractions* together, is no more than to multiply the Numerators and the Denominators among themſelves, and the Product thence ariſing will be that which is required. Thus $\frac{2}{5}\times\frac{7}{13}=\frac{14}{65}$. Thus alſo $\frac{7}{13}\times\frac{17}{73}=\frac{119}{949}$; ſo $\frac{1}{9}\times\frac{7}{5}=\frac{7}{45}$.

73. To *divide one Fraction* by another, you multiply the Denominator of the Diviſor by the Numerator of the Dividend, for the Numerator of the Quotient; then you multiply the Numerator of the Diviſor by the Denominator of the Dividend for the Denominator of the Quotient. Thus $\frac{14}{65}$ divided by $\frac{2}{5}$ will ſtand thus, $\frac{2}{5})\ \frac{14}{65}\ (=\frac{70}{130}=\frac{7}{13}$; and thus $\frac{7}{13})\ \frac{119}{949}\ (\frac{1547}{6643}=\frac{17}{73}$, by Reduction. Laſtly, $\frac{1}{9})\ \frac{7}{45}\ (\frac{63}{45}=\frac{7}{5}=1\frac{2}{5}$. Theſe Caſes of Diviſion being only the Reverſe of thoſe of Multiplication (72.)

47. Any whole Number is expreſſed Fraction-wiſe, by only writing Unity under it, thus 5 is $\frac{5}{1}$, 17 is $\frac{17}{1}$, &c. And ſo Integers and Fractions may be added, ſubtracted, multiplied or divided in the ſame Manner, as pure Fractions themſelves by the preceding Rules. Thus $\frac{2}{15} \times 5 = \frac{2}{15} \times \frac{5}{1} = \frac{10}{15} = \frac{2}{3}$. On the contrary, $5\,)\,\frac{2}{3}\,(= \frac{5}{1}\,)\,\frac{2}{3}\,(= \frac{2}{15}$.

CHAP. VI.

The Reduction of Quantities of divers Denominations into One.

75. THE Rule for doing this is to multiply each ſuperior Species by the Number which it contains of the propoſed Species below it. Thus one Pound is reduced to Numbers expreſſing an equal Value in all the inferior Species; as alſo other Quantities, as in the Examples below.

1 *l. Sterling.*
20

20 *Shillings.*
12

240 *Pence.*
4

960 *Farthings.*

1 *lb. Troy.*
12

12 *Ounces.*
8

96 *Drams.*
3

288 *Scruples.*
20

5760 *Grains.*

1 *lb. Avoirdupois.*
16

16 *Ounces.*
16

256 *Drams.*

1 *Tun.*
20

20 *Hundreds.*
4

80 *Quarters.*
28

2240 *Pounds.*
16

35840 *Ounces.*

$$\begin{array}{rl} 1 & \textit{lb. Apothecaries Wt.}\\ 12 & \\ \hline 12 & \textit{Ounces.}\\ 20 & \\ \hline 240 & \textit{Penny Wt.}\\ 24 & \\ \hline 5760 & \textit{Grains.}\end{array}$$

$$\begin{array}{rl} 1 & \textit{Day.}\\ 24 & \\ \hline 24 & \textit{Hours.}\\ 60 & \\ \hline 1440 & \textit{Minutes.}\\ 60 & \\ \hline 86400 & \textit{Seconds.}\end{array}$$

$$\begin{array}{rl} 1 & \textit{Mile}\\ 8 & \\ \hline 8 & \textit{Furlongs.}\\ 40 & \\ \hline 320 & \textit{Rods.}\\ 16\frac{1}{2} & \\ \hline 5280 & \textit{Feet.}\\ 12 & \\ \hline 63360 & \textit{Inches.}\end{array}$$

$$\begin{array}{rl} 1 & \textit{Circle.}\\ 12 & \\ \hline 12 & \textit{Signs.}\\ 30 & \\ \hline 360 & \textit{Degrees.}\\ 60 & \\ \hline 21600 & \textit{Minutes.}\\ 60 & \\ \hline 1296000 & \textit{Seconds.}\end{array}$$

76. If the Quantity, to be reduced, conſiſts of different Species, the Number of each ſeveral Species is to be taken in, or added to the Product which is of the ſame Kind or Denomination, as you proceed in the Reduction; according to what you ſee here exemplified.

$$\begin{array}{rrrr} \textit{l.} & \textit{s.} & \textit{d.} & \textit{f.}\\ 15 & 17 & 4 & 3\\ 20 & & & \\ \hline 317 & \textit{s.} & & \\ 12 & & & \\ \hline 3808 & \textit{p.} & & \\ 4 & & & \\ \hline 15235 & \textit{f.} & & \end{array}$$

$$\begin{array}{rrrr} \textit{lb.} & \textit{oz.} & \textit{pwts.} & \textit{grs.}\\ 9 & 7 & 15 & 21\\ 12 & & & \\ \hline 115 & & & \\ 20 & & & \\ \hline 2315 & & & \\ 24 & & & \\ \hline 9261 & & & \\ 4632 & & & \\ \hline 55581 & & & \end{array}$$

Hence ſeveral Queſtions may be propoſed for the Learner's Exerciſe, as follow.

lb. oz. drs.
In 35 13 15 Avoirdupoiſe Weight, how many Drams?
T. C. Qrs. lb.
In 17 13 3 25, how many Pounds?
M. F. R. F.
In 57 7 37 15, how many Feet?
D. H. ′ ″
In 275 17 39 48, how many Seconds?
R. S. ° ′ ″
In 15 10 27 49 53, how many Seconds?
Lds. Qrs. B. G.
In 35 4 7 5, how many Gallons?
Hgs. Gal. Pts.
In 13 51 7, how many Pints?

77. When we have any large Number expreſſing any Quantity in its lower Species, the ſame may be reduced to any or all the higher Species by Diviſion, being only the Reverſe of the other Proceſs by Multiplication ( ).

Thus ſuppoſe it were required to know how many Pounds, Shillings, Pence and Farthings were contained in 15235 Farthings? 'Tis evident, *if we divide firſt by* 4, *the Quotient will be Pence*; *this divided by* 12, *will quote Shillings*; *and theſe again divided by* 20, *will ſhew the Number of Pounds*; *the Remainders in each Diviſion being the odd Shillings, Pence, and Farthings.* The Work placed after the uſual Manner will ſtand as below.

```
                 12      20
    4 ) 15235 ( 3808 ( 317 ( 15
        12      36      20
        —       —       —
         32      20     117
         32      12     100
         —       —      ———
        ··35     88     17
          32     84
          —      —
          ·3     ·4
```

Anſwer 15*l.* 17*s.* 4*d.* 3*f.*

Again, In 55581 Grains, how many Pounds, Ounces, Pennyweights, and Grains?

```
                 20      12
24 ) 55581 ( 2315 ( 115 ( 9
     48          20      108
     —           —       ———
      75          31        7
      72          20
      —           —
       38         115
       24         100
       —          ———                  lb.  oz.  pwt.  grs.
       141         15        Anſwer    9    7    15    21
       120
       ———
        21
```

After the ſame Manner the Learner may operate the following Queſtions.

In 59786 Grains, how many Pounds, Ounces, Drams, Scruples, and Grains? Troy.

In 197568 Ounces, Avoirdupois, how many Tuns?

In 1000000 Feet, how many Miles, &c.

In 2974600″, how many Days?

In 5973864 Pints, how many Load?

CHAP. VII.

Of DECIMAL ARITHMETIC.

78. THE Nature and Notation of Decimal Numbers having been already declared (12, 13, 14,) I ſhall proceed immediately to give the Rules for their Operation. The firſt of which is

ADDITION.

The *Addition* of Decimal Numbers does no way differ from that of Integers, due Care being taken to place all the particular Sums, ſo that the firſt Places of the integral or decimal Parts be exactly under each other, as is ſeen in the following Examples, (See 25, 27.)

5,7	64,75	5,729
76,2	98,30	43,605
538,9	27,64	9,834
9761,5	59,37	30,546
		75,102
10382,3	250,06	164,816

79. If any Number be purely decimal, or has no integral Part, 'tis uſual to put a Cypher in Units Place of Integers, as thus,

0,057	0,5729
0,762	4,3605
5,389	0,9834
97,615	3,0546
	7,5102
103,823	16,4816

80. Cyphers on the Right Hand of a decimal Number avail nothing, and are therefore more elegantly omitted.

Thus inſtead of	0,0100	we write	0,01
	53,9270		53,927
	4,1009		4,1009
	975,2300		975,23
	87,1200		87,12
	1120,3879		1120,3879

SUBTRACTION.

81. The ſame Precautions being obſerved, *Subtraction* of Decimals is performed in all Reſpects like that of Integers, as in the Examples following. See (44.)

5723,8765	69527,8675
1310,6243	43486,574
4413,2522	26041,2935

572,0987	1435,2
179,5	1379,8256
392,5987	0055,3744
0,5697631	5.
0,5589030	4,876902
0,0108601	0,123098
10,005	100000,
0,0098753	9,0000001
9,9951247	99990,9999999

MULTIPLICATION.

82. In *Multiplication* of Decimals, having placed the Factors (as in common Multiplication, 51.) you obſerve this general Rule, *viz. Cut off ſo many Places of Figures for Decimals in the Product as there contain'd Decimal Places in both the Factors.*

Thus Mult.	17,35	57,38	48,97
by	4	1,6	3,84
	69,40	34428	19588
		5738	39176
		91,808	14691
			188,0448

1750	0,758	0,80507
0,76	0,52	0,305
10500	1516	402535
12250	3790	2415210
1330.	0,39416	0,24554635

83. But if it happens that when the Operation is finiſhed, there are not ſo many Figures in the Product, as there are Places of Decimals in the Factors, then Cyphers are to be prefix'd to

the Product to make the Number of Places equal. As in theſe Examples.

,3	,09	,00175	,001
,2	,08	,0076	,01
,06	,0072	1050	,00001
		1225	
		,000013300	

59.	,1000101	1000000.
,000006	,1	,00000001
,000354	,01000101	,01

DIVISION.

84. Diviſion of Decimals is alſo perform'd by one general Rule, *viz. Divide the Numbers as if they were all Integers, and then cut off ſo many Figures for Decimals in the Quotient as when added to thoſe of the Diviſor, do make the ſame Number of Decimals as are contain'd in the Dividend.* Examples follow. (See 51, 54.)

1,6) 91,808 (57,38
80
11 8
11 2
60
48
128
128
. . .

48,97) 188,0448 (3,84
146 91
41 134
39 176
1 9588
1 9588
. . . . .

1750) 1330,00 (,76
1225 0
105 00
105 00
. . . . .

,52) ,39416 (,758
,364
301
260
416
416
. . .

85. If, when the Diviſion is finiſhed, there are not ſo many Places in the Quotient as with thoſe Decimals in the Diviſor will equal the Number of Decimals in the Dividend, then Cyphers muſt be prefixed to equal that Number. As in theſe Examples,

,09) ,0072 (,08
72
..

59) ,000354 (,000006
354
...

86. When the Dividend is an integral Number, ſo many Cyphers are to be annexed thereto as there are decimal Places in the Diviſor; and the Quotient is in this Caſe integral.

Thus 2,5) 425.0 (170.
25
175
175
...0

,39) 741.00 (1900.
39
351
351
...00

5,116) 1279.000 (250.
1023 2
255 80
255 80
.0

,001) 597,000 (597000.
597
...

87. But if, when the Diviſion is thus far finiſhed, there happens to be any Remainder; then more Cyphers are to be annexed to the former in the Dividend, and ſo many Places are Decimal in the Quotient, as is evident in the following Examples. (See 61.)

```
,7 ) 673.0|00 ( 961,42
     63
     --
      43
      42
      --
       10
        7
       --
        30
        28
        --
         20
         14
         --
          6
```

```
1,3 ) 12976.0|000 ( 9981,538
      117
      ---
       127
       117
       ---
        [illegible]6
        104
        ---
          20
          13
          --
           70
           65
           --
            50
            39
            --
            110
            104
            ---
              6
```

```
,71 ) 29754,00|000 ( 41907,042
      284
      ---
       135
        71
       ---
        644
        639
        ---
         500
         497
         ---
          300
          284
          ---
           160
           142
           ---
            18
```

```
,015 ) 1.000|00 ( 66,66
        90
        --
        100
         90
        ---
         100
          90
         ---
          100
           90
          ---
           10
```

88. N. B. In Caſe any large decimal Numbers are to be multiplied by each other, and it be required to retain only a certain Number of decimal Places in the Product, you may contract the Work and ſhorten the Labour by proceeding as follows, viz. *Write down the Multiplicand as uſual, and then write under it the Multiplier inverted, with the Unit's Place thereof under that Place of the Multiplicand, whoſe Place you intend the Product ſhall extend to; then multiply, as uſual, by each Figure of the Multiplier, be-*

ginning

ginning at thoſe of the Multiplicand which ſtand over it, neglecting thoſe to the Left, unleſs ſo far as to obſerve what would ariſe from multiplying the Figure immediately foregoing, which muſt be taken in at the Beginning of each Line, the firſt Figure of all which muſt ſtand under one another on the Right-hand.

89. Thus let it be required to multiply 3,141592 by 52,7438 to have four Places of Decimals in the Product. And alſo 104226,8672 by ,261799388; the Work for each will ſtand as below.

Multiplicand	3,1415 92	104226,867 2
Multiplier inverted	8347,25	883997 162,0
	1 5707 96	20845 373 4
	628 32	6253 612 0
	219 91	104 226 8
	12 57	72 958 7
	94	9 380 3
	25	937 9
		31 2
Product =	165,69 95	8 3
		8
Product =		27286,529 4

90. The Reaſon of this Contraction will eaſily occur to any one who conſiders the Work at large, as it ſtands below for the firſt of theſe Examples.

3,1 4 1592	
5 2,7438	
2 5	1·32736
9 4	2 4776
125 6	6 368
2 199 1	1 44
6 283 1	8 4
157 079 6	0
165,699 5	0 01296

The perpendicular Line here drawn among the Figures cuts off all the ſuperfluous Part of the Work to the Right, and leaves the ſignificant Part on the Left, which is the ſame as the contracted Part, but in an inverted Order, which is the Reaſon why the Multiplier is inverted in that Caſe to produce it.

N. B. What relates to the Doctrine of *Repetends* or *circulating Decimals*, we ſhall refer to *Logarithms*; as this intricate Affair is moſt eaſily manageable by thoſe *artificial Numbers*.

CHAP.

CHAP. VIII.

The Reduction of Vulgar Fractions, and Quantities of divers Species to Decimal Numbers.

91. A Common Fraction is reduced into a decimal Expreſſion of the ſame Value by dividing the Numerator by the Denominator by the Rules in the preceding Chapter. As in the Examples below.

$\frac{2}{5}$ = 5) 2,0 (= 0,4
20
—
. .

$\frac{3}{8}$ = 8) 3,000 (= 0,375
24
—
60
56
—
40
40
—
. .

$\frac{1}{6}$ = 6) 1,000 (= 0,16
6
—
40
36
—
4

5 $\frac{3}{8}$ = $\frac{43}{8}$ = 8) 43,000 (5,375
40
—
30
24
—
60
56
—
40
40
—
. .

92. By this Means you find the decimal Value of any Species of *Money*, *Weight*, *Meaſure*, *Time*, *Motion*, &c. in any Denomination above it. *viz.* By dividing Unity by the Number expreſſing how many of that Species make One in the ſuperior De-

Denomination propoſed. Thus becauſe four Farthings make one Penny; therefore $\frac{1}{4} = 0,25$ is the Decimal of a Penny for one Farthing. In like Manner, $\frac{1}{12} = 0,083 =$ the decimal Part of one Shilling for a Penny; and $\frac{1}{20} = 0,05 =$ the Decimal of a Pound for one Shilling.

93. Again, if it be required to know what decimal Part of a Pound one Farthing is, becauſe 960 Fathings make a Pound, therefore $\frac{1}{960} = 0,0010416$ is the Decimal of a Pound for one Farthing. After this Manner the following Tables are made, ſhewing the decimal Value for each Species of the integral Quantity or higheſt Denomination, which is always Unity, or 1, in the ſeveral Sorts of Money, Weight, Meaſure, &c.

One Pound	1.
Shilling	0,05
Penny	0,00416
Farthing	0,0010416

Troy Pound	1.
Ounce	0,083
Dram	0,010416
Scruple	0,003472
Grain	0,0001736

One Tun	1.
Hundred	0,05
Quarter	0,0125
Pound	0,000446
Ounce	0,000028

One Mile	1.
Furlong	0,125
Rod	0,003125
Foot	0,000189
Inch	0,000016

One Day	1.
Hour	0,0416
Minute	0,000694
Second	0,0000011

A Circle	1.
Sign	0,083
Degree	0,0027
Minute	0,00004
Second	0,0000006

One Load	1.
Quarter	0,2
Buſhel	0,025
Gallon	0,003125
Pint	0,00039

One Tun of Wine	1.
Pipe	0,5
Hogſhead	0,25
Tierce	0,16
Gallon	0,003967.

94. Having any Quantity expreſſed in divers Species, as 15*l.* 17*s.* 4*d.* 3*f.* 'tis eaſy, by the Tables, to turn it into Decimals.

Thus

$$\begin{array}{rl} & \textit{l.} \\ \text{Thus} & \left\{\begin{array}{llcl} 1. & \times\ 15 & = & 15\,\textit{l.} \\ 0{,}05 & \times\ 17 & = & 0{,}85 \\ 0{,}00416 & \times\ 4 & = & 0{,}016 \\ 0{,}001 & \times\ 3 & = & \underline{0{,}003} \end{array}\right. \end{array}$$

Therefore 15*l.* 17*s.* 4*d.* 3*f.* = £ 15,869

95. Hence, by this Method, it will be eaſy to perform ſome Operations in Arithmetic, which would otherwiſe prove very irkſome and difficult. Thus, ſuppoſe it was required to

Feet Inches
Multiply 12 : $9\frac{3}{4}$ = 12,8124
By 7 : $5\frac{1}{2}$ = 7,4582

Now this would greatly puzzle a Learner to perform in the common Way, but when reduced to Decimals, is only a Caſe of common Multiplication. And it ſhould be a Maxim with Schoolmaſters never to torture the Genius of a Scholar with things extremely difficult, and at the ſame Time unneceſſary, or performable by eaſier Methods; which is but too commonly the Caſe.

CHAP. IX.

Of the Ratios of Numbers, and the Rules of Proportion, or Rule of Three Direct and Inverſe.

96. AS the Ratio of Numbers conſiſts of a Compariſon or Relation in reſpect of Magnitude; and as one Number may exceed another both by *Addition* and *Multiplication*, therefore two Sorts of Ratios will ariſe in the Compariſon of Numbers, *viz.* one, which will be expreſſed by their Difference when the leſſer is taken from the greater; and another, which will be expreſſed by the Quotient, in dividing the greater by the leſſer.

97. Hence, in this Series of Numbers 1, 2, 3, 4, 5, 6, 7, 8, *&c.* where each is greater or leſs than the other by Addition or Subtraction of 1, the common Difference will be 1 between any two contiguous Terms, which is therefore called the *common*

Ratio of the Series; thus the Ratio of 2 to 1, is $2 - 1 = 1$; of 5 to 4, is $5 - 4 = 1$; and ſo of the Reſt. But the Ratio of 3 to 1, is $3 - 1 = 2$, and 5 to $3 = 5 - 3 = 2$, which is double the former. And the Ratio of 4 to $1 = 4 - 1 = 3$, and 5 to $2 = 5 - 2 = 3$, *&c.* which are triple the Firſt. In the following Series 1, 3, 5, 7, 9, 11, 13, 15, *&c.* the Ratio or common Difference is 2. In this Series 5, 9, 13, 17, 21, 25, *&c.* the Ratio is 4; and ſo it may be any given Number, by which any Series of Numbers encreaſe or decreaſe. And hence ſuch a Series of Numbers are ſaid to be in *arithmetical Progreſſion.*

98. The other Sort of Ratio is that between Numbers which differ by a *common Multiplication or Diviſion*; Thus, if 1 and each ſubſequent Product be conſtantly multiplied by 2 this Series will ariſe, *viz.* 1, 2, 4, 8, 16, 32, 64, *&c.* and this conſtant Multiplier is the *common Ratio of the Series*; for the Ratio of any two proximate Numbers is the ſame; thus the Ratio of $2 : 1$ is $\frac{2}{1} = 2$; and the Ratio of $16 : 8 = \frac{16}{8} = 2$. Again, in this Series 1. 3. 9. 27, 81, 243, *&c.* the Ratio is 3; thus $3 : 1 = \frac{3}{1} = 3$, or $243 : 81 = \frac{243}{81} = 3$, and ſo of others.

99. In theſe Series, the Ratio of the third Term to the firſt is not *double* that of the Second to the Firſt, (as in arithmetical Series) but is ſaid to be *duplicate of it*; thus $4 : 1 = 2 \times 2 = 4$, whereas $2 : 1 = 2$, in the firſt Series; and in the ſecond Series, $9 : 1 = 3 \times 3 = 9$, whereas $3 : 1 = 3$. Again, the Ratio of the fourth Term to the Firſt is not *triple* (as in 91) but *triplicate* of the Ratio of the ſecond to the firſt. Thus, $8 : 1 = 2 \times 2 \times 2 = 8$, which is triplicate of $2 : 1 = 2$; or this latter Ratio is three Times involved in the former. Thus alſo $27 : 1 = 3 \times 3 \times 3 = 27$, which therefore is *triplicate* the Ratio of $3 : 1 = 3$, Whence a Series of Numbers having ſuch a Ratio is ſaid to be in *geometrical Progreſſion*,

100. Hence it is evident, that in order to make any Ratio twice as great as before, it muſt be multiplied by itſelf. Thus $2 : 1$ added to $2 : 1$, is $\frac{2}{1} \times \frac{2}{1} = \frac{4}{1}$; or $\frac{3}{1} \times \frac{3}{1} = \frac{9}{1}$, is $3 : 1$ added to it ſelf, or made twice as great. Conſequently, the *Addition of geometrical Ratios* is performed by multiplying thoſe Ratios by each other. Thus the Sum of the Ratios $5 : 3$ and $8 : 7$ is $\frac{5}{3} \times \frac{8}{7}$

=

$= \frac{40}{21} = 40 : 21$. Again, 1 : 3 added to 5 : 9 makes the Sum equal to the Ratio 5 : 27, becauſe $\frac{1}{3} \times \frac{5}{9} = \frac{5}{27}$.

101. On the other Hand, the *Subtraction of the geometrical Ratios* is performed by dividing the greater by the leſſer. Thus, if from 4 : 1 I take 2 : 1, there will remain 2 : 1, becauſe $\frac{2}{1}$) $\frac{4}{1}$ ($= \frac{2}{1}$. In like Manner, if from the Ratio 40 : 21 I ſubduct the Ratio of 8 : 7, there will remain the Ratio of 5 : 3 for $\frac{8}{7}$) $\frac{40}{21}$ ($= \frac{5}{3}$. And from the Ratio 5 : 27 if we take 5 : 9, there will remain 1 : 3; becauſe $\frac{5}{9}$) $\frac{5}{27}$ ($= \frac{1}{3}$.

102. From a Compariſon of geometrical Ratios reſults the *Doctrine of Proportion or Analogy* (21) for if there be three Numbers, ſuch that the Ratio between the firſt and ſecond be the ſame with the Ratio between the ſecond and third, then are thoſe Numbers ſaid to be *Proportionals*, as 1, 2, 4; for 1 : 2 = 2 : 4, or 1 : 2 : : 2 : 4. Alſo 1, 3, 9, are *proportional*, becauſe 1 : 3 = 3 : 9 (by 98.) Thus alſo four Numbers are proportional, when the Ratio is the ſame between the firſt and ſecond, as it is between the third and fourth; as 1, 2, 4, 8, or 1, 3, 9, 27; becauſe 1 : 2 = 4 : 8; and 1 : 3 = 9 : 27.

103. Theſe proportional Numbers are ſuch as either ſucceed each other immediately in the Series, as 1 : 2 : : 4 : 8, or 4 : 8 : : 16 : 32; and the Proportion is ſaid to be *continued*, and ſuch Terms are called *continual Proportionals*. But if the Ratios are taken between ſuch Pairs of Numbers as do not ſtand together, or immediately follow each other in the Series, then is the Proportion ſaid to be *diſcontinued* or *disjunct*. As in theſe 1 : 2 : : 8 : 16, or 4 : 8 : : 32 : 64; or 1 : 3 : : 81 : 243. And this makes what is vulgarly called the *Golden Rule* (becauſe of its Uſefulneſs) or *Rule of Three*.

104. For by this Rule, if any three Numbers are given as 3, 9, 81, a Fourth may be found which ſhall be in Proportion, that is, ſhall have the ſame Ratio to the third Term 81, as there is between the two firſt 3 and 9. And becauſe this fourth Term is as the unknown or ſought, let us call it x. Then by Suppoſition, $3 : 9 : : 81 : x$; therefore $\frac{9}{3} = \frac{x}{81}$ (by the Nature of the Series 98.)

105. Now it is an *Axiom, that if equal Things are multiplied by equal Things, the Product will be equal*; therefore if the two equal Ratios $\frac{9}{3}$, $\frac{x}{81}$ be each multiplied by the ſame Number 81, we ſhall have $\frac{9\times 81}{3}=\frac{x\times 81}{81}=x$, as is evident becauſe $\frac{81}{81}=1$, and ſo makes no Alteration in the Value of x; therefore the Rule is, *multiply the ſecond and third Numbers together, and divide the Product by the Firſt, the Quotient will be the fourth Number ſought.* Thus $\frac{9\times 81}{3}=243$, ſo that 3 : 9 :: 81 : 243, according to (98.)

106. Hence this Rule comes to be of very great and frequent Uſe in the various practical Affairs of Life, which I ſhall exemplify by a few Queſtions, as follows.

If 3 Yards coſt 9 Shillings, what will 81 Yards coſt? See the Operation.

```
  Yds. S.  Yds.  £.  S.
   3 : 9 :: 81 : 12   3
             9
          ----   20
      3 ) 729 ( 243 ( 12l.
          6     20
          -     --
          12    43
          12    40
          --    --
           9     3
           9
           -
           .
```

Anſwer 12*l.* 3*s.*

If 100*l.* gain 5*l.* Intereſt, what will 750*l.* gain in the ſame Time?

```
   l.    l.     l.    l.   s.
  100 :  5  ::  750 : 37   10
                 5
             --------
     100 ) 3750,0 ( 37,5 = 37l. 10s.
           3750 0
           ------
           .....
```

If the Moon deſcribes the whole Ecliptic, or 360° in $27\frac{1}{2}$ Days, how many Degrees does ſhe paſs thro' in one Day?

D. *D.*
Analogy. 27,5 : 360° :: 1 : 13°,09
1

27,5) 360 (13,09, *Anſwer.*
275
850
825
2500
2475
··35

According to the accurate Meaſures of the *French*, there are 57060 *Toiſes* in a Degree, or 242360 *Paris* Feet; the Circumference therefore of a great Circle is 123249600 Feet; and the *Paris* Foot is to the *Engliſh*, as 1068 to 1000; Quere how many *Engliſh* Feet and Miles are in the Earth's Circumference?

Paris Feet. *Eng. Feet.*
Analogy 1000 : 1068 :: 123249600 : 131630573
Then becauſe 5280 Feet = 1 Mile, ſay;
F. *M.* *F.* *M.* *Yds.* *F.*
As 5280 : 1 :: 131630573 : 24930 57 2.

107. When the Ratio of the Series is carried on by Diviſion below the firſt Term, as it is above it by Multiplication, as thus, $16 : 8 : 4 : 2 : 1 : \frac{1}{2} : \frac{1}{4} : \frac{1}{8} : \frac{1}{16}$, &c. then are the Ratios of theſe fractional Numbers to Unity, ſaid to be *inverſly* or *reciprocally* as the Ratios of the integral Numbers to Unity; that is, the Ratio of $\frac{1}{8}$ to 1 is the Reciprocal of 8 to 1; or $\frac{1}{8}$ is as *much leſs* as 8 is *greater* than Unity or 1.

108. When, therefore, any Queſtion in the Rule of Three is propoſed, and is of ſuch a Nature, that the fourth Number x, or Conſequent of the ſecond Ratio of the Analogy is reciprocally to its Antecedent of what the Conſequent in the firſt Ratio is to its Antecedent, then the *Rule of Three* is ſaid to be *Inverſe*.

And the Terms muſt be ſtated in a contrary or inverſe Order, as in the following Queſtion.

If 12 *Men do a Piece of Work in* 15 *Days, in how many Days will* 20 *Men do the ſame?*

Here it is evident, the 4th Number x cannot ſtand in the 4th Place, as before (104) *viz.* $12 : 15 :: 20 : x$; for then x would be directly to 20, as 15 to 12; but x muſt be leſs than 20, and therefore reciprocally as 15 to 12. Again it is plain, that $\overset{M.}{20} : \overset{M.}{12} :: \overset{D.}{15} : x$ Days; and becauſe the Proportion is here direct, therefore $\frac{12 \times 15}{20} = x$ (105.) Conſequently if we take the Terms as they ſtand in Queſtions of this Sort, the Rule for operating them in this, *Multiply the firſt and ſecond Numbers together, and divide by the Third, and the Quotient will be the fourth Number* (x) *ſought.* So in the preſent Caſe $\frac{12 \times 15}{20} = x = 9$ Days, the Anſwer.

109. I ſhall here ſubjoin a Queſtion or two of this Sort, as follows.

A Friend lends me 372l. *for* 7 *Years and* 8 *Months, how long muſt I lend him* 496l. *for an Equivalent?*

Then per Rule $\frac{496 \times 7{,}6}{372} = 5{,}75$ Years, Anſwer.

If 3 *Men, and* 4 *Women, can do a Piece of Work in* 56 *Days, how long will one Man and one Woman be doing the ſame?*

Becauſe of 3 Men and 4 Women, ſome Number muſt be found that may be divided by 3 and 4 without a Remainder, as the Number 12; then make the 3 Men or 4 Women equal to 12 Boys; and 1 Man will be equal to 4 Boys, and 1 Woman to 3 Boys, and 1 Man and 1 Woman to 7 Boys; then the Queſtion is reduced to this, *If* 12 *Boys do a Piece of Work in* 56 *Days, in how many Days will* 7 *Boys do the ſame?*

Anſwer $\frac{12 \times 56}{7} = 96$ Days.

110. I ſhall here ſay Nothing of the *compound Rule of Proportion*, or, as it is uſually called, the *Double Rule of Three*, wherein 5 Numbers are given to find a Sixth by means of two Analogies,

gies, becauſe this will be beſt explained, and the Reaſon of Operation will be more evidently ſeen, in the Method of treating this Subject in Algebra.

111. From what has been ſaid of Ratios, it is eaſy to make a Compariſon of their Magnitude, having firſt premiſed this Definition, viz. *That Ratio is ſaid to be* greater, equal to, or leſs *than another, whoſe Antecedent hath* a greater, or an equal, or a leſs *Proportion to its Conſequent, than the other's Antecedent hath to its Conſequent.* Thus the Ratio of 6 to 3 is ſaid to be greater, and the Ratio of 4 to 3 leſs than the Ratio of 5 to 3. Thus again, the Ratio 6 : 3 is greater, and the Ratio 6 : 5 leſs than the Ratio of 6 : 4.

112. Hence, when two Ratios are to be compared whoſe Antecedent and Conſequent are both different, *it will be proper to reduce them to the ſame Antecedent, or the ſame Conſequent, before the Compariſon be made*; as for Inſtance, ſuppoſe I would know which of the two Ratios 7 : 5 or 4 : 3 be the greater; to know this, I ſay, as $4 : 3 :: 7 : 5\frac{1}{4}$; then it is evident, 7 : 5 is a greater Ratio than $7 : 5\frac{1}{4}$ (by 111,) and conſequently greater than 4 : 3. Again, ſuppoſe I would compare the Ratios 3 : 4 and 5 : 7; then I ſay, as $3 : 4 :: 5 : \frac{20}{3} = 7 - \frac{1}{3}$; but the Ratio of $5 : 7 - \frac{1}{3}$ is greater than the Ratio of 5 : 7, and therefore the Ratio 3 : 4 is greater than the Ratio of 5 : 7.

113. In any Series of Numbers, 48, 40, 30, 15, *the Ratio of the Extremes is ſaid to be compounded of all the intermediate Ratios*; viz. $48 : 15 = 48 : 40 + 40 : 30 + 30 : 15$; which will eaſily appear by placing all Fraction-wiſe, thus; $\frac{48}{15} = \frac{48}{40} \times \frac{40}{30} \times \frac{30}{15} = \frac{48 \times 40 \times 30}{15 \times 40 \times 30}$, for it is plain, ſince 40×30 is in the Numerator and Denominator both, it makes no Alteration in the Value of the Fraction, which therefore is equal to $\frac{48}{15}$.

114. Hence, on the Contrary, any Ratio 48 : 15 may be reſolved into any Number of other leſſer Ratios of which it doth conſiſt, as ſo many Parts of the Whole. Thus $\frac{48}{15} = \frac{48}{40} \times \frac{40}{30} \times \frac{30}{15}$; or $\frac{48}{15} = \frac{48}{45} \times \frac{45}{35} \times \frac{35}{15}$. Thus alſo the Ratio of 48 to 5 may be decompounded, or reſolved into any other Number of Ratios, as $\frac{48}{42} \times \frac{42}{36} \times \frac{36}{27} \times \frac{27}{13} \times \frac{13}{5}$, and ſo in any other Caſe.

115. In any two Quantities or Numbers, whoſe Difference is very ſmall in reſpect of the Quantities themſelves, if ſo much be *added to one*, and *ſubtracted from the other*, as ſhall make their *Difference double* or *triple*, or *half*, or a *third Part* of what it was before, then thoſe Quantities or Numbers ſhall be in a *Duplicate* or a *Triplicate*, or a *Subduplicate* or a *Subtriplicate Ratio* of that they were in before any ſuch Change was made, nearly.

116. Thus let there be two Numbers 10 and 11, whoſe Difference is 1, then if $\frac{1}{2}$ be added to 11 and taken from 10 we have $11\frac{1}{2}$ and $9\frac{1}{2}$, whoſe Difference is 2, double of the former Difference. Now I ſay, the Ratio of $10\frac{1}{2}$ to $9\frac{1}{2}$ is *duplicate* of that of 11 to 10 nearly; for the Ratio of $11\frac{1}{2}$ to $9\frac{1}{2}$ is reſolvable into the Ratios $11\frac{1}{2} : 10\frac{1}{2}$, and $10\frac{1}{2} : 9\frac{1}{2}$ (by 114.) Now the Ratio of $11\frac{1}{2} : 10\frac{1}{2}$ is greater than the Ratio 11 to 10, and the Ratio of $10\frac{1}{2} : 9\frac{1}{2}$ is nearly as much leſs (as will appear from 112) therefore the Sum of both thoſe Ratios will be nearly equal to twice the Ratio of 11 to 10, that is, $\frac{11\frac{1}{2}}{10\frac{1}{2}} \times \frac{10\frac{1}{2}}{9\frac{1}{2}} = \frac{11}{10} \times \frac{11}{10}$, nearly; for the firſt is $\frac{120,75}{99,75}$, and the latter is $\frac{121}{100}$, which are very nearly equal.

117. Again, if we add 1 to 11 and take it from 10, we ſhall have 12 and 9, whoſe Difference is 3; then will the Ratio 12 : 9 be triplicate, or three Times as great as the Ratio 11 : 10. For $\frac{12}{9} = \frac{12}{11} \times \frac{11}{10} \times \frac{10}{9}$ (by 114) $= \frac{1320}{990}$; and $\frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} = \frac{1331}{1000}$, which two Fractions are very nearly equal.

118. Thirdly, if the Difference between 11 and 10 be reduced to half or a third Part, the Ratio will be reduced *ſubduplicately* or *ſubtriplicately*; thus add $\frac{1}{4}$ to 10, and take it from 11, and we have $10\frac{1}{4}$ and $10\frac{3}{4}$, whoſe Difference is half of the former. Now $10\frac{1}{4} : 10\frac{3}{4}$ is *ſubduplicate* of the Ratio 10 : 11, or as $\sqrt{10} : \sqrt{11}$. Alſo, if $\frac{1}{3}$ be added to 10 and taken from 11, you have $10\frac{1}{3}$ and $10\frac{2}{3}$, which are nearly in a *ſubtriplicate* Ratio of 10 to 11 or $\sqrt[3]{10}$ to $\sqrt[3]{11}$.

We ſee in theſe Examples how near theſe Ratios come to the Truth, where the Difference is no leſs than a 10th or 11th Part of the Whole; but if we ſuppoſe the Difference to be a much leſs Part of the Whole, as an 100th, a 1000th, &c. they will be much more accurate; ſo that to multiply or divide the Ratio it will be ſufficient to encreaſe or diminiſh one of the Numbers only. Thus 100 : 102 is *duplicate* of the Ratio 100 : 101; and 100 : 103 is *triplicate* the Ratio of 100 : 101. Alſo, $100 : 100\frac{1}{2}$ is *ſubduplicate*, and $100 : 100\frac{1}{3}$ is *ſubtriplicate* of the Ratio of 100 : 101, nearly.

119. Hence we obſerve, that the Ratio 100 : 101 is to the Ratio 100 : 102 as 1 : 2; and the Ratio 100 : 101 is to the Ratio 100 : 103, as 1 : 3; the Ratio $\overline{100 : 101} : \overline{100 : 104} :: 1 : 4$; and ſo on univerſally, which Theorem is of very great Uſe and ought to be well remembered by the *mathematical Reader*. What further relates to the Doctrine of *Ratios and Proportion*, will be delivered in Species (in the *Algebraic Part*) which will afford a more abſolute and univerſal Speculation of the Nature and Properties thereof than can be obtained from Numbers.

CHAP. X.

Of the Powers of Numbers, and the Extraction of Roots.

120. WHEN any Number is multiplied by itſelf, it is ſaid to be *ſquared*, and the Product is called the *Square* or ſecond Power of that Number; thus $2 \times 2 = 4$, ſo 4 is the Square of 2; and 2 is ſaid to be the *Square Root* of 4; and is thus expreſſed, $\sqrt{4} = 2$. So $7 \times 7 = 49$, and the Square Root of 49 is $\sqrt{49} = 7$, and ſo of any other Numbers.

121. As a Number multiplied by itſelf produces the Square, ſo that Square being multiplied by the ſaid Number, or Root, produces the *Cube*, or third Power. Thus $4 \times 2 = 2 \times 2 \times 2 = 8$, the *Cube* of 2; and $49 \times 7 = 7 \times 7 \times 7 = 343$, the *Cube* of 7. So the *Cube Root* of 8 is $\sqrt[3]{8} = 2$; and the *Cube Root* of 343 is $\sqrt[3]{343} = 7$; and ſo of others.

122. Thus you proceed by a conſtant Multiplication of every ſubſequent Product by the ſame Number to raiſe any Power of that Number you think fit, as you ſee done for the 9 Digits in the following Table to the ſixth Power.

Root, or firſt Power.	1	2	3	4	5	6	7	8	9
Square, or ſecond Power.	1	4	9	16	25	36	49	64	81
Cube, or third Power.	1	8	27	64	125	216	343	512	729
Biquadrate, or fifth Power.	1	16	81	256	625	1296	2401	4096	6561
Surſolid, or ſixth Power.	1	32	343	1024	3125	7776	16807	32768	59049

123. When the *Square Root* of any Number is propoſed to be found or extracted, it is done by the following

RULE.

Firſt, let the Figures of the Number be diſtinguiſhed into Pairs by fixing a Point over every other one, beginning at Unit's Place. Then write ſuch a Figure for the firſt Place in the Root, whoſe Square ſhall be equal to, or next leſs than the Figure or Figures from the laſt Point on the left Hand; then ſubtracting that Square, the other Figures of the Root will be found by taking down each Pair of Figures ſucceſſively to the Remainders, for new Dividends, and doubling the Root ſo far as extracted for the firſt Part of the Diviſor, enquire how often it is contained in the new Dividend, and place the Quotient for another Figure in the Root, and alſo annex it to the Diviſor, which will be then compleated.

124. This will be illuſtrated by the following Examples. Quere the Square Root of 144?

```
         . .
         144 ( 12, the Square Root required.
         1
         —
   22 ) .44
         44
         —
         ..
```

The Reaſon of pointing the Number in this Manner is, becauſe there are always *as many Places of Figures in the Root as there are Points over the given Number*. But, till we come to Algebra, the Reaſon of the whole Operation will not ſo well appear as by working it at large (for the common Way is but a ſort of Contraction) in the Manner following.

$\dot{1}4\dot{4}$ (10
100 ($\frac{2}{20}$

20) 44 (2, then 10 + 2 = 12, the Root.
$\frac{2}{22}$) 44

. .

Extract the Root of 219024.

$2\dot{1}9\dot{0}2\dot{4}$ (400 + 60 + 8 = 468, the Root.
160000

800) 59024 (60
$\frac{60}{860}$) 51600

460 × 2 = 920) 7424 (8
$\frac{8}{928}$) 7424

. . . .

But this Example contracted in the comman Way ſtands thus.

$2\dot{1}9\dot{0}2\dot{4}$ (468, the Root.
16

86) 590
516

928) 7424
7424

. . . .

Another Example here follows. To extract the Square Root of the Number 29506624.

```
           . . . .
           29506624 ( 5432 = the Root required.
           25
           --
  104 )    ·450
            416
           ----
 1083 )    ·3466
             3249
             ----
10862 )      21724
             21724
             -----
             .....
```

125. It is plain that Number muſt be a Square, whoſe Root may be extracted without a *Remainder*; and ſuch Numbers may be as well *Decimal* as *Integral*, as in the following Example. What is the Square Root of 156,25.

```
        . .  .
        156,25 ( 12,5 the Root required.
        1
        --
 22 )   ·56
         44
         --
245 )   1225
        1225
        ----
        ....
```

What is the Square Root of 50,2681?

```
         .  .  .
         50,2681 ( 7,09 = Root required.
         49
         --
1409 )   12681
         12681
         -----
         .....
```

Required the Square Root of 0,366025.

0,366025 (0,605 = the Root.
0
—
36
36
—
1205) 6025
6025
—
....

What is the Square Root of 0,00015625?

0,00015625 (0,0125 = the Root.
1
—
22) 56
44
—
245) 1225
1225
—
....

126. The Number that is not a Square, or whoſe Root cannot be extracted, is ſaid to be *ſurd*, or *irrational*; but the Roots of ſuch ſurd Numbers may be approximated in Decimals as near the Truth as required. For Inſtance, let it be required to extract the Square Root of 2. Annex to the given Surd, as many Pairs of Cyphers as you would have decimal Places in the Root, Thus

```
          . . . . . .
          2,0000000000 ( 1,41421
          1
         ——
   24 ) 1 00
            96
           ——
  281 ) · ·400
             281
           ————
  2824 ) 11900
         11296
         —————
 28282 ) · ·60400
            56564
           ——————
 282841 ) · 383600
            282841
            ——————
            100759
```

Thus it appears the Square Root of 2 is 1,41421 true to five Places of Decimals; if a greater Degree of Accuracy be required, more Places may be obtained by dividing the Remainder 100759 in the common Way by the Diviſor 28284 (omitting the firſt Figure 1) as you ſee below.

```
 28284 ) 100759 ( 3562
          84852
         ——————
         159070
         141420
         ——————
          176500
          169704
          ——————
          · ·67960
             56568
            ——————
             11392
```

Therefore the Square Root of 2 is ſtill more truely 1,414213562.

127. The Square Root of any Vulgar Fraction is extracted by extracting the Root of the Numerator and Denominator for the fractional Root. Thus the Square Root of $\frac{25}{36}$ is $\frac{5}{6}$; for 5 is the Root for 25, and 6 the Root of 36, and $\frac{5}{6} \times \frac{5}{6} = \frac{25}{36}$; and ſo the Square Root of $\frac{144}{256}$ is $\sqrt{\frac{144}{256}} = \frac{12}{16}$; and ſo you proceed for any other. But in ſome Caſes, the beſt Way will be to convert the *Vulgar* into a *Decimal Fraction* (by 91.) and ſo extract the Root in Decimals, as above taught (in 125,126.)

128. The Extraction of the *Cube Root* will prove too difficult a Taſk in common Numbers; and as Nothing can be eaſier by Logarithms, I ſhall there ſhew the Method of doing it. Beſides, the Reaſon of the Thing cannot be ſhewn till the Reader comes to the Algebraic Part, where it will be evident enough.

129. The Biquadrate Root of any Number is eaſily had by extracting the Square Root of the given Number firſt, and then the Square Root of that Root: Thus, let it be required to extract the *Biquadrate Root* of 4857532416.

```
            . . . . .
            4857532416, ( 69696,
            36
            --
    129 )   1257
            1161
            ----
   1386 )    9653
             8316
             ----
  13929 )   133724
            125361
            ------
 139386 )    836316
             836316
             ------
             ......
```

```
          . . .
Then 69696, ( 264, = the Biquadrate Root.
      4
     ---
 46 ) 296
      276
     -----
524 )  2096
       2096
      -----
       ....
```

For 264 × 264 × 264 × 264 = 4857532416. And thus you proceed in any other Caſe where the *Biquadrate Root* is required.

CHAP. XI.

Of the Nature and Uſe of LOGARITHMS.

130. IF a Series of Numbers in *Arithmetical Progreſſion*, beginning from 0, and whoſe common Ratio is Unity, be appoſitely placed over another Series of Numbers in *Geometrical Progreſſion*, in the following Manner, *viz.*

Arith.	0,	1,	2,	3,	4,	5,	6,	7,	8,	9,	*&c.*
Geom.	1,	2,	4,	8,	16,	32,	64,	128,	256,	512,	*&c.*

Then we may obſerve the following Things.

131. *Firſt*; The ſeveral Terms in the Arithmetical Series *expound the Ratio* of the correſponding Terms in the Geometrical Series to the firſt Term; thus, 2 in the upper Series ſhews the Ratio of the Geometrical Series is *twice* repeated between 4 and 1; 5 ſhews the Ratio 5 Times repeated between 32 and 1; or that the Ratio 32 : 1 is 5 Times as great as the Ratio 2 : 1; and 9 denotes the Ratio 512 : 1 to be 9 Times as great as the firſt Ratio 2 : 1; and ſo of the Reſt.

132. *Secondly*; That to the *Addition* of any two or more Terms in the Arithmetical Series, correſponds a *Multiplication* of the Numbers under them in the Geometrical Series; as in the following Examples.

A. $1+2=3$; $2+3+4=9$; $1+3+5=9$; &c.
G. $2\times4=8$; $4\times8\times16=512$; $2\times8\times32=512$; &c.

133. *Thirdly*; That for every *Subtraction* of Terms in the Arithmetical Series, there correſponds a *Diviſion* of the Numbers under them in the Geometrical Series; as in theſe Inſtances.

A. $2-1=1$; $7-3=4$; $9-4=5$; &c.
G. $4\div2=2$; $128\div8=16$; $512\div16=32$; &c.

134. *Fourthly*; That when any Term in the Arithmetical Series is *doubled*, *tripled*, *quadrupled*, &c. there anſwers an *Involution* of the correſponding Term in the Geometrical Series to the *ſecond*, *third*, *fourth*, &c. *Power*, Thus

A. $3+3=6$; $3+3+3=9$; $2+2+2+2=8$.
G. $8\times8=64$; $8\times8\times8=512$; $4\times4\times4\times4=256$.

135. *Fifthly*; That if any Term in the Arithmetical Series be *divided* by 2, 3, 4, &c. there anſwers an Evolution or Extraction of the *Square*, Cubic, Biquadratic, &c. Root in the correſponding Term of the Geometrical Series. Thus

A. $4\div2=2$; $6\div3=2$; $8\div4=2$; &c.
G. $\sqrt{16}=4$; $\sqrt[3]{64}=4$; $\sqrt[4]{256}=4$; &c.

136. *Sixthly*; That in the Arithmetical Series, if any three proximate Numbers be taken, the *Sum of the two Extreams is equal to double the middle Number*; thus, 3, 4, 5, give $3+5=4\times2=8$; and 7, 8, 9 give $7+9=8\times2=16$. Whence alſo $\frac{3+5}{2}=4$, and $\frac{7+9}{2}=8$, or *half the Sum of the Extremes is equal to the Mean*. And the Caſe is the ſame if any two Numbers of the Series be taken, their Sum will be always double of the Mean or middle Term between them. Thus, 1, 3, 5 give $1+5=2\times3=6$; and 2, 5, 8 give $2+8=2\times5=10$. Alſo if 4 Terms be taken any how, the *Sum of the two Extremes will always be equal to the Sum of the two Means*; thus, 1, 2, 3, 4, give $1+4=2+3=5$; and 3, 5, 7, 9, give $3+9=5+7=12$, &c.

137. *Seventhly*; That as every *Addition* of Terms in the *Arithmetical Series* has a correſponding *Multiplication* of Terms in the *Geometrical Series* (by 132,) therefore *the Product of the two Extremes, in any three* Proportionals, *is equal to the Square of the Mean*; thus, in 8, 16, 32 we have $32 \times 8 = 16 \times 16 = 256$; and therefore alſo $\sqrt{32 \times 8} = 16$, *viz.* the *Square Root of the Product of any two Numbers is always a Mean Proportional between them.*

138. *Eighthly*; That of any Terms in the Geometrical Series, *the Product of the two Extremes is ever equal to the Product of the two Means.* Thus, 2, 4, 8, 16, give $16 \times 2 = 8 \times 4 = 32$. And 2, 8, 32, 128, give $128 \times 2 = 32 \times 8 = 256$.

139. *Ninthly*; Hence, of four Terms in the Arithmetical Series, the *laſt is equal to the Difference between the Sum of the two Means and the firſt Term.* Thus, of 3, 5, 7, 9, we have $5 + 7 - 3 = 9$; or $7 + 5 - 9 = 3$. And in the *Geometrical Series*, the *laſt of the four Proportionals is equal to the Product of the two Means divided by the firſt Term.* Thus, of 8 : 32 : 128 : 512, we have $\frac{32 \times 128}{8} = 512$; or $\frac{128 \times 32}{512} = 8$. As we have elſewhere ſhewn (in 105.)

140. From what has been hitherto premiſed, it appears, that the Series of Numbers in Arithmetical Progreſſion, are the LOGARITHMS of the Numbers in the other Series of Geometrical Proportionals; for all that we mean by *Logarithms*, is no more than *ſuch a Sort of Numbers as are artfully contrived to expreſs or expound the Ratios of common natural Numbers, conſidered as Terms in a Scale of Geometrical Proportion.* Now theſe Numbers in Arithmetical Progreſſion, anſwer every Part of this Definition of Logarithms with reſpect to the Series below them (by what was obſerved in 131.) and therefore are their *Logarithms*, i. e. *Exponents of their Ratios*, as the Word imports in its *Greek Etymology*.

141. From hence it appears, that if we conſider *our natural Numbers* as Terms in a Scale of Geometrical Progreſſion, then if ſuch other Numbers were invented and adapted thereto in a Series of Arithmetical Progreſſion, theſe would be *Logarithms*

of the other; to their *Addition* and *Subtraction* would anſwer a *Multiplication* and *Diviſion* of the reſpective common Numbers (by 132, 133.) Alſo by *doubling* or *tripling* them, we Square or Cube their Numbers; (by 134) or by dividing by 2, 3, &c. you extract the *Square*, *Cubic*, &c. Root of their Numbers, (by 135.)

142. Now ſuch a Table or Canon of *Logarithmic Numbers* has been contrived and compoſed by our late Mathematicians, and are in every one's Hands for Uſe. I ſuppoſe I ſcarce need tell the Reader that Lord *Napier* (a *Scotch* Nobleman) invented, and together with the Aſſiſtance of our Countryman Mr. *Henry Brigs*, calculated and compleated the Canon in preſent Uſe. The Labour of doing this was prodigious in the Way they took for it, but of late, eaſier and more conciſe Methods have been invented, of which more hereafter.*

143. That the Reader may have ſome Idea of the Method they took for this Purpoſe, he muſt conſider that 1, 10, 100, 1000, 10000, 100000, &c. are a Series of Numbers in Geometrical Progreſſion, whoſe common Ratio is 10; and a Series of Numbers in Arithmetical Progreſſion adapted to them as Logarithms will ſtand as below.

A.	0.	1.	2.	3.	4.	5.	&c.
G.	1.	10.	100.	1000.	10000.	100000.	&c.

144. If now we ſuppoſe the common Ratio 10 to be divided into 10000000 equal Parts, or *Ratiunculæ*, then ſince the Logarithm of 1 to 10 is 1, this Logarithm or Unity 1, will alſo be divided into 10000000 equal Parts, or *Decimals*; of which half the Number, *viz.* 0,5000000 will be the Logarithm of the Mean Proportional between 1 and 10, which let us call A.

Then will the Logarithms be for

Numb.		Logarithms.
1	:	0,0000000
A	:	0,5000000
10	:	1,0000000

145.

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* Several other Methods of conſtructing a Canon of Logarithms will be delivered when we come to treat of *Algebra* and *Fluxions*; this we have here given, ſtands firſt in Order, and riſes immediately from the Principles of *common Arithmetic*.

145. In like Manner, a Mean Proportional between A and 10, call B, and its Logarithm will be half the Sum of the Logarithms of A and 10; and ſo

The Logarithms will be for
A : 0,5000000
B : 0,7500000
10 : 1,0000000

146. Alſo between 1 and A, and A and B, you find Mean Proportionals and their Logarithms, and thus you may conceive the Proceſs for every one of the 10000000 Means; among which you'll find *eight Means* which will be ſo near the ſame with our eight Digits 2, 3, 4, 5, 6, 7, 8, 9, that the Difference will be wholly inconſiderable, and alſo their Logarithms, which will be as below, *viz.*

	Numb.		Logarithms.	Numb.		Logarithms.
Thus,	1	:	0,0000000	6	:	0,7781513
	2	:	0,3010300	7	:	0,8450980
	3	:	0,4771213	8	:	0,9030900
	4	:	0,6020600	9	:	0,9542425
	5	:	0,6989700	10	:	1,0000000

147. That is, ſince there are 10000000 Mean Proportionals between 1 and 10, the Number 2 will be the 3010300th of theſe; ſo the Number 3 will be the 4771213th; the Number 5 will be the 6989700th, and ſo of the Reſt. Alſo the Ratio or Diſtance of 4 from Unity being twice as great as the Diſtance of 2, its Logarithm is twice as big, and for the ſame Reaſon the Logarithm of 9 is twice as big as the Logarithm of 3; and the Logarithm of 8, three Times as great as the Logarithm of 2; and ſo on.

148. In like Manner, the Logarithm for all the Numbers between 10 and 100, 100 and 1000, and ſo on to 100000, denote the Places or Diſtances of thoſe Numbers in a Scale of Geometrical Proportionals, conſiſting of 10000000, 20000000, 30000000, &c. Terms. Thus 73 is the 18633229th Term; 743 is the 28709888th Term; and 9745 is the 39887818th Term in the Scale or Series of 40000000.

149. But ſince we make the Exponent or Logarithm of 1 to 10, to be 1; that of 1 to 100, 2; &c. (by 143) therefore

theſe Logarithms muſt be looked upon as *Decimal Numbers*, and only the firſt Figure Integral; which is called the Index; and they are thus expreſſed.

viz.
3 : 0,4771213
73 : 1,8633229
743 : 2,8709888
9745 : 3,9887818

150. And here you obſerve the Index of the Logarithm is *leſs by Unity* than the Number of Figures in that Number of which it is the Logarithm, the Reaſon of which is very plain from (143) and what has been ſince delivered. N. B. *In reading, this Table of Logarithms ſhould lie before the Eye for Inſpection.*

151. If a Number conſiſt of the ſame Figures, whether it be *integral*, *mixed*, or *pure Decimals*, the Logarithm will ſtill be the ſame, except the *Index*, *which will be always leſs by* 1, *than the Number of Places in the Integral Part* (149). And when the Number is purely Decimal, the Indexes will alſo be expreſſed Decimally, all which will be clear by the Examples in the following Table.

N. B. As many as the Decimal Index is leſs than 9, ſo many Cyphers are prefixed to the Decimal Numbers, as is here evident.

Numbers		Logarithms.
9541	:	3,9795939
954,1	:	2,9795939
95,41	:	1,9795939
9,541	:	0,9795939
0,9541	:	,9,9795939
0,09541	:	,8,9795939
0,009541	:	,7,9795939

152. It remains now that we ſhew how commodiouſly the Operations of common Arithmetic are performed by Logarithms, and firſt,

Of MULTIPLICATION *by* LOGARITHMS.

The Rule for the Operation is this, *add together the Logarithms of the Factors, the Sum is the Logarithm of the Product.* (By 132) But the Difficulty conſiſts in finding the proper Indices to the Sums; for which obſerve the following Particulars. (1.) If the Indeces are both *integral*, the Sum is ſo too. (2.) If one be Integral, and the other Decimal, the Sum, if under 10, will be Decimal; if juſt 10, or more than 10, caſt away 10, and the Remainder is Integral. (3.) If the Indices are both Decimal, and the Sum above 10, caſt away 10, and the Remainder will be Decimal; and then the Cyphers to be prefixed to the Decimal Product, will be as many as ſuch an Index is leſs than 9. See the following Examples.

153. *Examples of* INTEGERS.

Example I.
Multiply 12 = 1,079181
By 8 = 0,903090
The Product 96 = 1,982271

Example II.
Multiply 526 = 2,720986
By 100 = 2,000000
The Product 52600 = 4,720986.

Example III.
Multiply 987600 = 5,994581
By 517 = 2,713490
The Product 510589200 = 8,708071

154. *Examples of mixed Numbers.*

Example I.
Multiply 12,4 = 1,0934217
By 3,6 = 0,5563025
The Product 44,64 = 1,6497242

Example II.
Multiply 36,5 = 1,5622929
By 0,00019 = ,6,2787536
The Product 0,006935 = ,7,8410465

Example III.
Multiply 0,762 = ,9,8819550
By 570 = 2,7558748
The Product 434,34 = 2,6378298

Example IV.
Multiply 0,0097 = ,7,9867717
By 0,00021 = ,6,3222193
The Product 0,000002037 = ,4,3089910

155. DIVISION of *Integers* and *Decimals* by LOGARITHMS.

The Rule.
From the Logarithm of the *Dividend*,
Subtract the Logarithm of the *Diviſor*;
The *Remainder* is the Logarithm of the *Quotient*.

Example I.	Divide	44,64	= 1,6497242
	By	12,4	= 1,0934217
	Quotient	3,6	= 0,5563025
Example II.	Divide	310	= 2,4913617
	By	4,275	= 0,6309361
	Quotient	72,51457	= 1,8604256
Example III.	Divide	434,34	= 2,6378298
	By	7,62	= 9,8819550
	Quotient	570	= 2,7558748
Example IV.	Divide	,006935	= ,7,8410465
	By	36,5	= 1,5622929
	Quotient	,00019	= ,6,2787536
Example V.	Divide	,000002073	= ,4,3089910
	By	,00021	= ,6,3222193
	Quotient	,0097	= ,7,9867717

156. As the Operation of ſuch Decimal Numbers as contain *ſingle* or *compound Repetends* is moſt eaſily performed by *Logarithms*, (ſee Inſt. 90) ſo we ſhall here proceed to that Buſineſs, having firſt premiſed, that if one Number *A*, be to be divided by another *B*, the Quotient will be the ſame as when Unity is divided by the Number *B*, and the Quotient multiplied by the other *A*; thus 4) 12 (3 = $\frac{1}{4} \times 12$; now if from the Logarithm of Unity or 0, you ſubtract the Logarithm of any Number, the Remainder is called the *Arithmetical Compliment* of that Number. Thus from the Logarithm of Unity = 0,0000000
take the Logarithm of 12,4 = 1,0934217
remains the Arithmetical Compliment = ,8,9065783
which is plainly nothing more than the Logarithm of the Fraction $\frac{1}{12{,}4}$; if therefore

To the Logarithm of 44,64 = 1,6497242
You add the Arithmetical Compliment of 12,4 = 8,9065783
The Sum is the Logarithm of 3,6 = 0,5563025
The ſame as in Example I. of Diviſion (155).

157. Any Digit multiplied by 10 and divided by 9, becomes a *Repetend*; thus 6 × 10 = 60, and 9) 60 (= 6,666$\acute{6}$, &c. = 6,$\acute{6}$; and the ſame in Decimals 0,6 × 10 = 6, and 9) 6 (= 0,$\acute{6}$. Alſo any Number multiplied by Unit with as many Cyphers annexed as it contains Places, and then divided by as many Nines, becomes a *compound Repetend.* Thus 23 × 100 = 2300, and 99) 2300, (= 23,$\acute{2}\acute{3}$, and 527, × 1000, = 527000, and 999,) 527000, (= $\acute{5}2\acute{7}$; and ſo of others.

158. Hence ſince the Logarithms of $\frac{10}{9}$, $\frac{100}{99}$, $\frac{1000}{999}$, &c. are 0,0457575, 0,0043648, 0,0004345, &c. therefore we eaſily obtain the Logarithms of any pure, ſingle, or compound Repetend.

Example. Required the Logarithm of $\acute{6}$?
To the Logarithm in the Table for 6 = 0,7781512
Add the Logarithm of $\frac{10}{9}$ = 0,0457575
The Sum is the Logarithm of $\acute{6}$ = 0,8239087

And becauſe it may be of Uſe ſometimes, I have here ſubjoined a Table of the Logarithms of all the Nine Digits *perpetually circulating.*

$\acute{1}$ = 0,0457575
$\acute{2}$ = 0,3467875
$\acute{3}$ = 0,5228787
$\acute{4}$ = 0,6478175
$\acute{5}$ = 0,7447275
$\acute{6}$ = 0,8239087
$\acute{7}$ = 0,8908555
$\acute{8}$ = 0,9488475
$\acute{9}$ = 1,0000000

159. In the ſame Manner we proceed for the Logarithms of pure compound Repetends.

Example 1. Required the Logarithm of the Repetend $\acute{2}\acute{4}$?
To the Tabular Logarithm of 24, = 1,3802112
Add the Logarithm of $\frac{100}{99}$ = 0,0043648
The Sum is the Logarithm of $\acute{2}\acute{4}$, = 1,3845760

Example 2. Required the Logarithm of $\acute{3}6,\acute{3}$?
To the Tabular Logarithm of $\acute{3}6,\acute{3}$ = 1,5622929
Add the Logarithm of $\frac{1000}{999}$ = 0,0004345
The Sum is the Logarithm of $\acute{3}6,\acute{3}$ 1,5627274.

160. Now with Reſpect to *mixed Repetends*, as $2,\dot{6}$, $2,7\dot{8}\dot{3}$, $7\dot{2}5,\dot{6}$, &c. it is evident (by 157) that $2,\dot{6} = 2,\frac{6}{9}$, and that $2,7\dot{8}\dot{3} = 2,7\frac{83}{99}$, and $7\dot{2}5,\dot{6} = 7\frac{25,6}{99,9}$ and ſo on; but $2,\frac{6}{9} = \frac{24}{9}$, and this multiplied by 9, becomes barely 24; but any Number multiplied by 9, is the ſame as when multiplied by 10, and once ſubtracted; whence $\overline{2,\dot{6} \times 10,} - 2,\dot{6} = 24$. Hence this *general Rule* is deduced.

From the mixed Repetend multiplied by 10, ſubtract itſelf; or (which is the ſame Thing) from any mixed Repetend ſubtract the terminate Part, and to the Logarithm of the Remainder, add the Arithmetical Complement of as many Nines as there are Places of Figures in the Repetend, and the Sum will be the Logarithm of the ſaid mixed Repetend.

Example 1. Required the Logarithm of $2,\dot{6}$?

From the given Repetend —— $2,\dot{6}$
Subtract the terminate Part —— 2
To the Logarithm of the Remainder 2,4 = 0,3802112
Add the Arithmetical Complement of 9 = 0,0457575
The Sum is the Logarithm of —— $2,\dot{6}$ = 0,4259687.

Example 2. Required the Logarithm of $2,7\dot{8}\dot{3}$?

From the given Repetend —— $2,7\dot{8}\dot{3}$
Subtract the terminate Part —— 27
Then to the Logarithm of the Remainder 2,726 = 0,4355258
Add the Arithmetical Complement of the Logarithm of —— —— 99 = 0,0043648
The Sum is the Logarithm of the Repetend —— —— —— $2,7\dot{8}\dot{3}$ = 0,4398906.

Example 3. Required the Logarithm of $7\dot{2}5,\dot{6}$?

From the Repetend —— —— $7\dot{2}5,\dot{6}$
Subduct the conſtant Part —— 7
To the Logarithm of the Remainder 724,9 = 2,8602781.
Add the Arithmetical Compliment of — 999 = 0,0004345
The Sum is the Logarithm of —— $7\dot{2}5,\dot{6}$ = 2,8607126.

161. The Learner is now prepared to work any of the common Rules of Arithmetic, where the Operations are tedious or

difficult, in a very eaſy and conciſe Manner, by *Logarithms*, of which take the following Examples.

Example 1. In Duodecimal Multiplication.

F. In. F. In.
Required the Area of 9 : 10 by 8 : 8?

F. In.
Add { The Logarithm of 9 : 10 = 9,8ʒ = 0,9927008
To the Logarithm of 8 : 8 = 8,ϐ = 0,9378521

F. In.
Sum is the Logarithm of the Area required. } 85 : 2¾ = 85,ƻ = 1,9305529.

As *Diviſion* is only the Reverſe, it needs no Example.

162. Example 2. In the *Rule of Three Direct*.

If 2 *C.* 3 *Qrs.* 21 *lb.* of Sugar —— 2,9375 = 0,4679778
Coſt 6*l.* 1*s.* 8*d.* —— —— 6,08ʒ = 0,7841316
What will 12 *C.* 2 *Qrs.* coſt? —— 12,5 = 1,0969100
1,8810416
Anſwer, 25*l.* 17*s.* 8*d*¼. —— 25,8864 = 1,4130638.

Note, here the Logarithm of the firſt Number is ſubtracted from the Sum of both the others; but a more conciſe Way is to take the *Arithmetical Complement* of the firſt (which we denote by *A. C.*) and then the Whole is performed by *one Addition.*

Example 3. At one Operation.

If ½ *C.* of Tobacco (*A. C.*) —— 0,5 = 0,3010300
Coſt 4*l.* 17*s.* 8*d.* —— —— 4,6ʒ = 0,6658935
What will 7 *lb.* coſt? —— —— 0,0625 = 8,7958800
Anſwer, 11*s.* 7*d.* —— —— 0,5791ϐ = 9,7628035.

163. Example 4. *Inverſe Proportion*; at one Operation.

If Wheat be 6*s.* 4*d. per* Buſhel —— 6,ʒ = 0,8016325
And the Penny White Loaf weigh 7¾ *oz.* 7,75 = 0,8893017
What is the Weight, at 3*s.* 10*d.* *p.* Buſhel (*A. C.*) —— —— —— —— } 3,8ʒ = 9,4164234
Anſwer, 12 *Oz.* 16 *Pwt.* 2 *Grs.* —— 12,8043 = 1,1073576.

Here we take the Arithmetical Complement (*A. C.*) of the third Term, the Reaſon of which is evident from (156).

164. EXTRACTION of ROOTS by *Logarithms*.

Example 1. Required the *Square Root* of 2830,24?

The Logarithm thereof is —— 3,4518232

One Half is the Logarithm of the Root 53,2 = 1,7259116

Example 2. What is the *Square Root* of 14,6?

The Logarithm of that Number is —— 1,1663314

Half of which is the Logarithm of the Root 3,8297 = 0,5831657

165. Example 3. Required the Cube Root of 1,728?

The Logarithm of —— — 1,728 = 0,2375437

A third of which is the Logarithm of the Root 1,2 = 0,0791812.

Example 4. What is the Cube Root of 0,27589?

The Logarithm thereof is —— —— ,9,4407132

$\frac{1}{3}$ Part thereof is the Logarithm of — 0,6509 = ,9,8135710.

The Cube Root required.

N. B. In Decimal Numbers, where the Indices are Decimal, in extracting the *Square Root* you add 10 to the Index; for the *Cube Root* 20; for the *Biquadrate Root* 30; and ſo on.

Example 5. Required the ſeveral Roots of the laſt Number, for Inſtance.

The Logarithm of the Number	0,27589	=,9.4407132
The Half is the Logarithm of the *Square* Root ——	0,52523	=,9.7023566
A third Part, of the *Cube* Root —	0,6509 &	=,9.8135710
A Fourth, the *Biquadrate* ——	0,7247 &	=,9.8601783
A Fifth, the *Surſolid* Root ——	0,7729 &	=,9.8881426.

Thus you ſee how extremely eaſy it is to extract any Root out of any Number by Logarithms, and eſpecially in ſuch Caſes where by the common Rules the Operation is very laborious and difficult, and ſometimes quite impracticable.

The Reaſon of extracting Roots by Logarithms, is evident from what we have obſerved of theſe Numbers in (135). Since to Square or Cube any Number, is only to multiply it by it's ſelf once, or twice, we thought it needleſs to give any Examples in Logarithms of that Affair; eſpecially, ſince they are only the Reverſe of the foregoing, and evident from (134.)

166. To find a *Mean Proportional* between any two Numbers, as 3, and 243.

Add the Logarithm of the Numbers	3,=	0.4771212
	243,=	2.3856063
The Sum is ——— ———	=	2,8627275
Half of which is the Logarithm of the Mean required, *viz.*	27,=	1,4313637

For 3 : 27 : : 27 : 243.

167. To find two Mean Proportionals between any two Numbers, as 27, and 729.

To double the Logarithm of the firſt Number ——— ———	27,=	1,4313638 1,4313638
Add the Logarithm of the laſt —	729,=	2,8627275
The Sum is ——— ———		5,7254551
A Third of which is the Logarithm of the *firſt Mean*, viz.	81,=	1,9084850
To this add the Logarithm of the laſt Number again, *viz.* ———	729,=	2,8627275
The Sum is —— ——— ———		4,7712125
Half that is the Logarithm of the ſecond Mean required. ———	243,=	2,3856062

For 27 : 81 : : 243 : 729. Or thus, having found the *firſt Mean*, as here 81, you know then the *Ratio* of the Series 27) 81 (= 3 the Ratio, therefore *from the Logarithm of the firſt Mean, ſubtract the Logarithm of the firſt given Number, the Remainder is the Logarithm of the Ratio; which add to the Logarithm of the firſt Mean, the Sum is the Logarithm of the ſecond Mean; and again, added to the Logarithm of the Second, it gives the Logarithm of the third Mean*, and ſo on. All which is evident from what we firſt premiſed concerning the Nature of a Geometrical Series, and Logarithms adapted thereto. See (130, 131, &c.)

We might now have proceeded to the Computations of *Intereſt*, *Annuities*, &c. which are beſt performed by Logarithms, but

John Ryley Rithmetick
January 11th 1756

OF
THEOLOGY,
AS A
SCIENCE.

WE propoſe to treat of Theology here, not in the uſual Way as a Matter of *Faith*, but as a true and genuine *Science*, or Subject of real Knowledge, and that in regard both to the Object and the Principles on which it depends. The Object is the Doctrine of a Deity, or the Exiſtence of a Supreme Being, and the Principles of this Science are the Evidences and Proofs on which ſuch a Doctrine is founded: If ſuch are found to exiſt in, or to reſult from the Nature and Reaſon of Things, then the Object they ſupport and point out to us is not to be eſteemed the Subject of Belief, but of real Knowledge and Science; for if a Thing be once proved to be a plain Truth, and really to exiſt, we muſt then be ſaid to *know*, and not to *believe* that it is. It would be looked upon as the higheſt Impropriety of Expreſſion for any one to ſay, he believes that the three Angles of a Triangle are equal to two right Angles, even though he may be ſuppoſed not to have ſeen the Demonſtration of it, becauſe he muſt be convinced of the Certainty of ſuch a Demonſtration, and therefore of the Truth of the Propoſition; and indeed we ſhould think a Perſon very weak, who ſhould pretend to ſay, he *believed* there was ſuch a Place as *Rome*, or *Grand Cairo*, only becauſe he never was there to ſee them; ſince he cannot but know, from the common Veracity of Mankind in general, that there are ſuch Places in Being. Now, if it be abſurd and weak for us to ſpeak of thoſe Objects, as the Subjects of Belief, whoſe Exiſtence we know to be real, though at the ſame Time we ourſelves have not been immediately able to prove it, how much more muſt it appear to be ſo, when that Doctrine is conſtantly repreſented as an Article of our Faith, which, nevertheleſs, we are able to prove does really exiſt, from the united Teſtimonies of all our Senſes, the Force of the cleareſt Reaſon, and the univerſal Conſent of Mankind? And this is a Demonſtration in a higher Degree, if poſſible, than even that which we call *Mathematical*, and therefore it would derogate much from the Dignity of Theology to repreſent it in any other Light than that of the moſt perfect and ſublime of all Sciences.

The Object of this Science, as I have obſerved, is the *Doctrine* of *God*'s *Exiſtence*, concerning which three Propoſitions will ariſe: The firſt relating to the Eſſence of the Divine Being; the ſecond to his Attributes, and the third to the Evidences and Demonſtration of the Whole. As to the firſt of theſe, *viz.* the Nature and Eſſence of God, we ſhall here preſume to ſay nothing of ourſelves, as we judge this too nice a Subject to be enquired into, or treated of, by any but Perſons of the moſt elevated Underſtandings and moſt compleat Knowledge of Things, if it be poſſible even for ſuch to comprehend a Subject of ſo high a Nature; I believe we may be excuſed therefore, if we admit the Thoughts of one Man only, upon this Topic, *viz.* the incomparable Sir *Iſaac Newton*, who, as he by far the beſt of all Men, underſtood Nature, we make no Scruple to ſuppoſe, that he could, by much the beſt of all, diſcourſe of what relates to the Eſſence and Attributes of the Author of Nature; and ſince he has obliged us with a Diſcourſe of this Kind, we are proud to have an Opportunity of introducing it here in his own Words.

" This Being governs all things, not as the Soul of the World, " but as Lord over all: And on Account of his Dominion, he is " wont to be called Lord God, or univerſal Ruler. For God is " a relative Word, and has a reſpect to Servants. And Deity is " the Dominion of God, not over his own Body, as thoſe imagine, who fanſy God to be the Soul of the World, but over " Servants. The Supreme God is a Being eternal, infinite, abſolutely perfect: But a Being, however perfect, without Dominion, cannot be ſaid to be Lord God; for we ſay, my God, " your God, the God of *Iſrael*, the God of Gods, and Lord of " Lords; but we do not ſay, my Eternal, your Eternal, the " Eternal of *Iſrael*, the Eternal of Gods; we do not ſay, my " Infinite or my Perfect; theſe are Titles which have no reſpect to Servants. The Word God uſually ſignifies Lord; but every Lord is not a God[*]. It is the Dominion of a ſpiritual Being which conſtitutes a God; a true, ſupreme, or imaginary Dominion makes a true, ſupreme, or imaginary God. And from his true Dominion it follows, that the true God is a living, intelligent, and powerful Being; and from his other Perfections, that he is Supreme or moſt Perfect. He is Eternal and Infinite, Omnipotent and Omniſcient; that is, his Duration reaches from Eternity to Eternity: His Preſence from Infinity to Infinity; he governs all Things, and knows all Things that are, or can be done. He is not Eternity or Infinity, but Eternal and Infinite; he is not Duration or Space, but he endures and is preſent. He endures for ever, and is every where preſent; and by exiſting always and every where, he conſtitutes Duration or Space. Since every Particle of Space is always, and every indiviſible Moment of Duration is every where, certainly the Maker and Lord of all Things cannot be never, and no where. Every Soul that has Perception is, though in different Times and in different Organs of Senſe and Motion, ſtill the ſame indiviſible Perſon. There are given ſucceſſive Parts in Duration, co-exiſtent Parts in Space, but neither the one nor the other is the Perſon of a Man, or his thinking Principle; and much leſs can they be found in the thinking Subſtance of God: Every Man, ſo far as he is a Thing that has Perception, is one and the ſame Man during his whole Life, in all and each of his Organs of Senſe. God is the ſame God, always and every where. He is omnipreſent, not virtually only, but alſo ſubſtantially; for Virtue cannot ſubſiſt without Subſtance. In him [†] are all things

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[*] Dr. *Pocock* derives the *Latin* Word *Deus* from the *Arabic Du*, (in the Oblique Caſe *Di*,) which ſignifies Lord. And in this Senſe, Princes are called Gods, *Pſalm* lxxxii. *Ver*. 6. and *John* x. *Ver*. 35. and *Moſes* is called a God to his Brother *Aaron*, and a God to *Pharaoh*, (*Exod*. iv. *Ver*. 16, and vii. *Ver*. 8. And in the ſame Senſe, the Souls of dead Princes were formerly by the Heathens called Gods, but falſly, becauſe of their want of Dominion.

[†] This was the Opinion of the Ancients. So *Pythagoras in Cicer. de Nat. Deor*. Lib. 1. *Thales*, *Anaxagoras*, *Virgil*, *Georg*. Lib. 4. Ver. 220. and *Æneid*. Lib. 6. Ver. 721. *Philo Allegor*. at the Beginning of *Lib*. 1. *Aratus* in his *Phænom*. at the Beginning. So alſo the ſacred Writers, as St. *Paul*, *Acts* xvii. *Ver*. 27, 28. St. *John*'s Goſp. *Chap*. xiv.

“ contained and moved; yet neither affects the other: God
“ ſuffers nothing from the Motion of Bodies; Bodies find no Reſiſtance
“ from the Omnipreſence of God. 'Tis allowed by all,
“ that the Supreme God exiſts neceſſarily; and by the ſame Neceſſity
“ he exiſts always and every where. Whence alſo he is
“ all Similar, all Eye, all Ear, all Brain, all Arm, all Power
“ to perceive, to underſtand, to act; but in a Manner not at all
“ Human, in a Manner not at all Corporal, in a Manner utterly
“ unknown to us; as a blind Man has no Idea of Colours,
“ ſo have we no Idea of the Manner by which the all-wiſe God
“ perceives and underſtands all things. He is utterly void of all
“ Body and bodily Figure, and can therefore be neither ſeen, nor
“ heard, nor touched; nor ought he to be worſhipped under
“ the Repreſentation of any corporal Thing. We have Ideas
“ of his Attributes, but what the real Subſtance of any Thing is,
“ we know not. In Bodies we ſee only their Figures and Colours,
“ we hear only the Sounds, we touch only their outward
“ Surfaces, we ſmell only the Smells, and taſte the Savours;
“ but their inward Subſtances are not to be known, either by
“ our Senſes, or by any reflex Act of our Minds; much leſs then
“ have we any Idea of the Subſtance of God. We know him
“ only by his moſt wiſe and excellent Contrivances of Things
“ and final Cauſes; we admire him for his Perfections; but we
“ reverence and adore him on Account of his Dominion. For
“ we adore him as his Servants; and a God without Dominion,
“ Providence, and final Cauſes, is nothing elſe but Fate
“ and Nature, Blind, metaphyſical Neceſſity, which is certainly
“ the ſame always and every where, could produce no Variety
“ of Things, All that Diverſity of natural Things, which we
“ find ſuited to different Times and Places, could ariſe from nothing
“ but the Ideas and Will of a Being neceſſarily exiſting,
“ But by Way of Allegory, God is ſaid to ſee, to ſpeak, to
“ laugh, to love, to hate, to deſire, to give, to receive, to rejoice,
“ to be angry, to ſigh, to frame, to work, to build. For all our
“ Notions of God are taken from the Ways of Mankind, by a

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xiv. *Ver.* 2. *Moſes* in *Deut.* iv. *Ver.* 39. and x. *Ver.* 14. *David, Pſalm* cxxxix. *Ver.* 7, 8, 9. *Solomon*, 1 *Kings* viii. *Ver.* 27. *Job* xxii. *Ver.* 12, 13, 14. *Jeremiah* xxiii. *Ver.* 23, 24. The Idolators ſuppoſed the Sun, Moon and Stars, the Souls of Men and other Parts of the World to be Parts of the Supreme God, and therefore to be worſhipped, but erroneouſly.

“certain Similitude which, though not perfect, has ſome Likeneſs however. And thus much concerning God; to diſcourſe of whom from the Appearances of Things, does certainly belong to natural Philoſophy.”

This great Man has alſo given us his Thoughts concerning the Original of Nature, or the firſt Formation and Conſtitution of Things, which we think a very proper Sequel to his foregoing Diſcourſe, and ſhall give it the Reader in his own Words.

“All things being conſidered, it ſeems probable to me, that God in the Beginning, formed Matter in ſolid, maſſy, hard, impenetrable, moveable Particles, of ſuch Sizes and Figures, and with ſuch other Properties, and in ſuch Proportion to Space, as moſt conduced to the End for which he formed them; and that theſe primitive Particles being Solids, are incomparably harder than any porous Bodies compounded of them; even ſo very hard, as never to wear or break in Pieces; no ordinary Power being able to divide what God himſelf made one in the firſt Creation. While the Particles continue entire, they may compoſe Bodies of one and the ſame Nature and Texture in all Ages; but ſhould they wear away, or break in Pieces, the Nature of Things depending on them would be changed. Water and Earth, compoſed of old worn Particles and Fragments of Particles, would not be of the ſame Nature and Texture now, with Water and Earth, compoſed of entire Particles in the Beginning. And therefore, that Nature may be laſting, the Changes of corporal Things are to be placed only in the various Separations, and new Aſſociations and Motions of theſe permanent Particles; compound Bodies being apt to break, not in the midſt of ſolid Particles, but where thoſe Particles are laid together, and only touch in a few Points.”

Such is the natural, ſublime, and beautiful Account of the firſt Formation of Matter, and its Diſpoſition and Fitneſs to conſtitute the peculiar Nature and ſpecific Properties of Bodies. After which, he goes on to ſhew us, that theſe Conſiderations afford us the fulleſt and cleareſt Conviction of Wiſdom and Deſign in all the Works of Creation, and are therefore to be regarded as the genuine Principles of natural Knowledge, and at the ſame Time a perfect Demonſtration of the Being and Attributes of God: For thus he proceeds,

“ Now by the Help of theſe Principles (*viz.* of Matter and
“ Motion) all material Things ſeem to have been compoſed of
“ the hard ſolid Particles above mentioned, variouſly aſſociated in
“ the firſt Creation by the Counſel of an intelligent Agent. For
“ it became him who created them to create them in Order, and
“ if he did ſo, it's unpliloſophical to ſeek for any other Origin of the
“ World, or to pretend that it might ariſe out of a Chaos by the
“ mere Laws of Nature; though being once formed, it may continue
“ by thoſe Laws for many Ages. For while Comets move
“ in very excentric Orbs in all manner of Poſitions, blind Fate
“ could never make all the Planets move one and the ſame Way in
“ Orbs concentric, ſome inconſiderable Irregularities excepted,
“ which may have riſen from the mutual Actions of Comets and
“ Planets upon one another, and which will be apt to increaſe,
“ till this Syſtem wants a Reformation. Such a wonderful Uniformity
“ in the Bodies of Animals, they having generally a
“ right and a left Side ſhaped alike, and on either Side of their
“ Bodies two Legs behind, and either two Arms, or two Legs,
“ or two Wings before upon their Shoulders; and between their
“ Shoulders a Neck running down into a Back-bone, and a Head
“ upon it, and in it two Ears, two Eyes, a Noſe, a Mouth,
“ and a Tongue, alike ſituated. Alſo the firſt Contrivance of
“ thoſe very artificial Parts of Animals, the Eyes, Ears, Brain,
“ Muſcles, Heart, Lungs, Midriff, Glands, Larynx, Hands,
“ Wings, ſwimming Bladders, natural Spectacles, and other
“ Organs of Senſe and Motion, and the Inſtinct of Brutes and
“ Inſects, can be the Effect of a powerful ever-living Agent,
“ who being in all Places, is more able by his Will to move the
“ Bodies within his boundleſs uniform Senſorium, and thereby
“ to form and reform the Parts of the Univerſe, than we are by
“ our Will to move the Parts of our own Bodies. And yet we
“ are not to conſider the World as the Body of God, or the ſeveral
“ Parts thereof as the Parts of God. He is an uniform
“ Being, void of Organs, Members or Parts, and they are his
“ Creatures ſubordinate to him, and ſubſervient to his Will;
“ and he is no more the Soul of them, than the Soul of Man is
“ the Soul of the Species of Things carried through the Organs
“ of Senſe into the Place of its Senſation, where it perceives
“ them by Means of its immediate Preſence, without the Inter-

" vention of any third Thing. The Organs of Senſe are not for
" enabling the Soul to perceive the Species of Things in its
" Senſorium, but only for conveying them thither; and God
" has no need of ſuch Organs, he being every where preſent to
" the Things themſelves. And ſince Space is diviſible in infini-
" tum, and Matter is not neceſſarily in all Places, it may be
" alſo allowed, that God is able to create Particles of Matter of
" ſeveral Sizes and Figures, and in ſeveral Proportions to Space,
" and perhaps of different Denſities and Forces, and thereby to
" vary the Laws of Nature, and make Worlds of ſeveral Sorts
" in ſeveral Parts of the Univerſe. At leaſt, I ſee nothing of
" Contradiction in all this."

Thus we have a Summary of the *Newtonian Theology*, with a general Rationale thereof; alſo we have at the ſame Time the moſt conſiſtent and natural Account of the *Coſmogony*, or original Formation of the World, that can be any where found, very different from the weak, obſcure, and ludicrous Stories we find among the Ancients, relative to this Matter. He likewiſe points out to us the Certainty and demonſtrative Proofs of infinite Power, Wiſdom, and Deſign, in the eſtabliſhed Courſe of Nature in general; and particularly in the Conſtruction and Diſpoſition of the ſeveral Parts of every Kind of Body. And indeed it would argue in us ſuch a great Degree of Weakneſs as would fall but very little ſhort of Stupidity, if we could not underſtand, that the Eye was formed on purpoſe to ſee, and the Ear to hear, when we obſerve every Thing in their Structure neceſſary to anſwer thoſe Ends; and the ſame may be ſaid of the other Organs of Senſation. And we ſhould look upon it as a greater Degree of Infatuation, for a Perſon to ſuppoſe, that he, who firſt invented a Teleſcope, did not underſtand the Nature of Viſion; or that he, who firſt contrived the *Organ*, was not acquainted with the Doctrine of Sounds, than if he ſhould deny the plaineſt Propoſition in *Euclid*. How much more abſurd and ſenſeleſs muſt it be, to deny a perfect Knowledge of theſe Things, in him, who firſt form'd the infinitely more perfect Organs for theſe Purpoſes in animal Bodies! But to conclude, I need only obſerve, that there is the ſame Sort of Demonſtration for the Exiſtence of a Deity, which we collect from Obſervations and the Works of Nature, as *Euclid* makes Uſe of in his Elements of Geometry; for his Method is only this, *viz.* to ſhew the Truth of a Propoſition by proving it to reſult from the Nature and Neceſſity of Things, or by ſhewing the Abſurdity that would immediately follow from denying it. And thus, when in the Works of Nature we obſerve a certain End propoſed, and the Parts of Bodies every Way fitted and properly calculated to anſwer that End; when all the Parts conducive thereto are finiſhed in the higheſt Perfection; when they are neither more nor leſs than are neceſſary; and when the whole, and every Part is an Effect ſurpaſſing all human Power, Art, or Underſtanding; we are then ſtrictly neceſſitated to aſcribe them to the infinite Power and Wiſdom of God: For if we deny it to be his Work, we are then reduced to the moſt palpable Abſurdities of allowing Effects of infinite Kinds to exiſt without any adequate, or even poſſible Cauſe. For no Perſon of any Degree of Reaſon, could impute them to Chance, or think them any caſual Events, but to give a direct and poſitive Proof of the higheſt Inſtance of *divine Geometry and Harmony* in the Works of Nature; and to illuſtrate the ſame by a well-known Fact, let any Perſon draw a right Line, of a proper Length, in which let a well-poliſhed *Mirrour* (either *Convex* or *Concave*) be placed, then ſhall all the Rays of Light be reflected from ſuch a Mirrour, in ſuch a Manner, that the *Place*, the *Center*, and *Focus* of the Mirrour, the *Place*, and *Image* of the Object, are five Points that will ever divide that Line into *muſical Proportion*, of which we ſhall give a mathematical Demonſtration in another Place; therefore ſuch a Conſideration muſt for ever ſilence an *Atheiſt*, if the Depravity of Human Nature can be ſo very great as to render it poſſible for any ſuch Perſon to exiſt. Upon all Accounts therefore the Principles of Theology are in the higheſt Degree certain and *ſcientifical*, and therefore we ſhall take a curſory View of them as they copiouſly ariſe and offer themſelves to our Notice, from every Subject we can examine in the amazing and boundleſs Field of Nature, having firſt of all premiſed, That the human Underſtanding extends to no Ideas or Principles of Knowledge, but thoſe which are derived from the Impreſſions of *material Objects* upon the Senſes. This is a fundamental Truth, which we ſo conſtantly experience, and is in itſelf ſo evident, that it is one of thoſe Principles we call *Axioms*, or ſuch as cannot be made plainer, by any Demonſtration, than they are in their Nature by mere Definition.

From hence we are aſſured, that no *immaterial Beings*, or *Spirits*, as we call them, can be the Objects of human Knowledge, any farther than they can by any Means affect the Senſes; and by ſome of the wiſer Part of Men, it is queſtioned if they can do that. But be this as it will, it is certain, that the real Eſſence of *Matter* and *Spirit* is wholly unknown to Man; and is to be diſcovered only by their ſenſible Properties, Modifications, and Effects. We find ſomething in Nature of which all ſenſible Objects conſiſt, and we call that Matter, or Subſtance; and that is one Way or other diſcoverable by all our Senſes.

On the other Hand, we find this Matter, under all its various Forms, when conſidered in itſelf, abſolutely inert, inactive, motionleſs, and without any Power to alter its preſent State; but when we conſider theſe Parts of Matter variouſly aſſociated together in the Compoſition of different Bodies, we then obſerve a Power between them which actuates, and puts them in Motion, and is the Cauſe of all thoſe different Effects that are produced in their various Admixture in the Compoſition of all natural Bodies, and this we call the *univerſal Power*, or *Agency of Nature*.

Again, this Power is obſerved ſo to act upon, and influence the ſeveral Parts of Matter, as to cauſe them to unite and form themſelves into ſuch Kind of Bodies, and with ſuch particular Properties and Qualities, as fit and qualify them to anſwer ſome general Purpoſe or End, and thereby evidently we ſee the Effects of *Deſign* and *Contrivance*, and conſequently diſcover the Exiſtence of an *Author* of ſuch *univerſal Wiſdom*, *Power* and *Skill*; and as theſe *Effects* are obſerved to be above all the Powers of *human Nature*, they muſt neceſſarily be the Work of that *Mind*, or *Spirit*, we call God. And, *laſtly*, as the Power which orders all Things appears to be unlimited, and his Deſigns perfect and without End, it follows, that ſuch a Being, or Spirit, muſt be poſſeſſed of infinite Power, Wiſdom, and all other poſſible Perfections.

By ſuch a Method of Obſervation and Reaſoning, it is, that we come by the genuine and proper Notions of a *Deity*; and there is no other Way that we can have any real Knowledge of a Supreme Being. The Arguments, *a Priori*, from the Nature and Neceſſity of Things, give us but a faint and uncertain Light into this great Doctrine: But thoſe, *a Poſteriori*, from the Operations of Nature, are ever clear, certain, and concluſive; and what have always been looked upon as the *ſteady*, *unerring Light of Nature*.

And ſince every Part of Nature's Works aloud proclaims the *Power*, *Wiſdom* and *Glory* of God; we ſhall point out to our Readers, the particular Topics from whence theſe ſublime Arguments are more immediately deduced, and on which this natural and moſt rational Theology depends; which we diſtinguiſh into its ſeveral Species in the following Manner.

I. Physico-Theology, or that ariſing from the Conſideration of *meer Matter*. As the Parts of Matter are themſelves inert, the Power that actuates and moves them muſt be divine. The uniform Manner in which this Power always acts, is an Argument of its being divine; for whatever Names we call it by, it ever acts in the ſame Manner, *viz.* by *Attraction*, in very *near Diſtances*, of the Particles or Maſſes; or by *Repulſion*, when they exceed that Diſtance; for it is always obſerved, that where the *Sphere of this attracting Power ends*, there a repulſive Force begins. Nor is the *Extent* of the attracting Sphere the ſame every where, or among all the Parts of Matter, but varies according to the different Deſign it is to anſwer: Thus, among the Corpuſcles of Matter, it extends to a very ſmall, yea, altogether inſenſible Diſtance; in the Magnet, to a conſiderable and ſenſible Diſtance, and in the larger Bodies of the Syſtem, to a Diſtance beyond our Comprehenſion. Theſe Circumſtances all prove Wiſdom and Deſign in the Being from whence theſe Powers are derived. Again, the Effects of theſe Powers are all very different, ſuch as the Nature of Things requires; thus a *Coheſion*, or Union of the Parts of Matter in one Caſe is produced; in another, a Separation of the Parts; and thence it is, we find, innumerable Claſſes of *conſiſtent Bodies* on one Hand, and of *elaſtic Bodies* on the other, both which are neceſſary in the preſent State of Nature. We farther obſerve, that ſome of thoſe Powers act in a general Way on all Parts of Matter; and others in a very particular Manner, as that of the Magnet, which extends to no other Bodies but the Magnet and Iron; and the Reaſon thereof is evident, *viz.* becauſe the *Needle* only was neceſſary to be animated thereby for the Purpoſes of Navigation. The conſtant and inceſſant Action of this Power proves it to be a *divine Energy*; for were theſe Powers of *Attraction*, *Repulſion*, or *Gravitation*, to intermit or ceaſe for any Time, we ſhould ſee all Nature in Confuſion; there would be no *Coheſion*, no *Elaſticity*, no *Weight* in Bodies; and therefore it could be of no Sort of Uſe in Nature. And laſtly, we obſerve, that the various Parts of Matter receive from this Power a peculiar and ſpecific Diſpoſition to unite and form themſelves into innumerable diſtinct Subſtances, always retaining the ſame Forms, Properties, and general Natures; from whence ariſes that infinite Variety of different Orders and Claſſes of Beings, more or leſs perfect in their ſeveral Kinds and Species. All theſe Obſervations moſt evidently prove a *divine Agency* on the Parts of inert Matter, conſtituting and preſerving an infinitely various, beautiful, and harmoneous Œconomy of Nature.

From this general View of a *divine Ordination* in Matter, we proceed to conſider the wonderful Inſtances of Counſel and Deſign in the Nature, Frame, and End, we ſo evidently obſerve in the Structure and Properties of that infinite Variety of Bodies we ſee it formed and moulded into by the ſame Almighty Hand: Beginning firſt with thoſe which are moſt conſiderable, *viz.* the celeſtial Bodies, or thoſe we call *Worlds*, and of which Syſtems of Worlds are formed. And firſt, in each Syſtem we find one Body much more conſpicuous than the Reſt, which affords us the illuſtrious Topic of

II. HELIO-THEOLOGY, or a Demonſtration of infinite Power and Wiſdom in the Formation of the SUN. For whether we conſider its component Parts, its prodigious and immenſe Bulk, its Poſition or Situation in the Syſtem, and its Office there, it will appear in every Particular, much more upon the Whole together, to be the *loudeſt Oracle* of Divinity in its great Contriver, which the Works of Nature afford. As to the Bulk or Magnitude of the Sun, it is, indeed, immenſely great, (being at leaſt 100 Times larger in Diameter than the Globe of the Earth we live on) but this ſtupendous Bulk is neceſſary in the Sun, when we conſider it as the *Fountain of Light and Heat* to a Syſtem of ſuch prodigious Dimenſions, as that of our Planets and Comets is known to be; for by a Computation, it is eaſily found, that the Magnitude of the Sun, with reſpect to the planetary Syſtem, bears no greater Proportion than that of a common-ſized Candle to a Room of a circular Form of a 100 Feet in Diameter; and therefore, its Light and Heat will appear to be nothing more than is quite neceſſary to illuminate and cheriſh the planetary Bodies of the Syſtem; and very ſmall it muſt be indeed, for anſwering ſuch Purpoſes in the Bodies of the *Comets* that rove to vaſtly greater Diſtances. Again, the prodigious Magnitude of the Sun is neceſſary to anſwer the Purpoſes of a gravitating Force; for the Power of Gravity is well known to act upon Bodies according to their ſolid Dimenſions, or is proportioned to the Quantity of Matter; therefore, unleſs the Sun's Body were vaſtly large, and contained a prodigious Quantity of Matter, there could not be a ſufficient centripetal Force, in the central Body of the Syſtem, to govern the Motions of ſeveral revolving Bodies of the Planets and Comets, and retain them in their proper Orbits; all which plainly proves infinite Wiſdom and Deſign in the Formation of the Sun in reſpect to its *Magnitude:* In the next Place, if we conſider the Matter of the Sun's Body, we ſhall find it to be ſuch as conſtitutes the pureſt and moſt intenſe Fire in Nature; and it is neceſſary it ſhould be thus, that it might afford a ſufficient Quantity of Light and Heat to the ſeveral planetary Worlds; for according to the preſent Conſtitution of Nature, it would be impoſſible for any of them to ſubſiſt without ſuch a Proviſion: This we are certain of with reſpect to our own Earth, and Reaſon bids us conclude it for all the Reſt; for without Heat, it is well known, there could be no ſuch Thing as animal Life, no vegetable Growth, no mineral Productions of any Kind, nor any Motion or Fluidity in Bodies; without this Principle of genial Heat to actuate the Parts of Matter, and make them move into all the ſpecific Forms of Bodies, they would be all fixed, and congealed into one motionleſs and adamantine Maſs, ſuch would be the horrid Aſpect and Condition of Nature without the ſolar Beams. Then, ſuppoſing there was Heat, that alone would anſwer no Purpoſe; for without Light at the ſame Time, how wretched muſt be the Condition of every animal Syſtem, and our Exiſtence in that Caſe would be worſe than none at all; how great therefore the Wiſdom and Goodneſs of the Author of Nature to cauſe that both thoſe neceſſary and ſalutary Effects ſhould reſult ſolely from the Action of the Particles of Fire!

But we have, as yet, conſidered only one Part of the Subſtance, or Matter of the Sun's Body; for according to all our Knowledge of Fire, we find, that there is conſtantly a *Pabulum* neceſſary to ſupport it, by which we mean ſomething inflammable, or whoſe Parts are naturally converted into Fire; ſuch then we muſt neceſſarily ſuppoſe is the internal Part, or *Nucleus* of the Sun's Body, and indeed, we ſee ſomething of this in what we uſually call the *Maculæ*, or Spots in the Sun; for they appear to be nothing more than the Parts of this internal *Nucleus*, exhauſted of their ignified Particles, or inflammable Matter, and what we commonly call a *Calx*; for *ſuch* Parts will always appear dark or opake. From whence we may infer, that the Fire of the Sun muſt neceſſarily ſtand in need of a conſtant Recruit of this ignific Matter, or *Pabulum*; and this too we are aſſured of from Obſervation; for the Spots of the Sun, we often find, will diſappear of a ſudden, and its whole Face appear with an uniform Ardour and Refulgence, and will continue ſo to do for Years together; the Spots then begin to appear again, and from Year to Year increaſe, after which, the Sun being again repleniſhed with new *Pabulum*, they diſappear again, and ſo on, as has been obſerved from Age to Age. But whence this Supply is derived, we have not hitherto been able to determine. It is, however, very probably conjectured to be made by the Bodies of the Comets at different Times falling into the Sun; for it is well known, that the Comets, each Time they return, approach nearer to the Sun, in their *Perihelion*, and at laſt drop into it: Beſides, we are well aſſured, that the Bodies of the Comets are the fitteſt of any we know of in Nature for that Purpoſe, as they conſiſt of ſuch a prodigious Quantity of inflammable Matter, that ſo readily kindles into, and conſtitutes that enormous Pillar of fiery Matter, that we call their Tails, whenever they are ſufficiently heated by the Sun; and we know not but this may be the principal, if not the only End they anſwer.

As to the Atmoſphere of the Sun, we ſhall here ſay nothing, though it is well known, that a Body of Fire, or Flame, cannot ſubſiſt without it; and Sir *Iſaac Newton* has mentioned ſuch a

Thing, and therefore it is probable, that ſuch a circumambient *Medium* may be provided for the Sun, to keep its Parts together.

The Situation of the Sun in the Center of the Syſtem is in the next Place highly worthy our Notice; for on this Account his Light and Heat are equally and uniformly diſpenſed to each particular Planet of the Syſtem, at all Times, and every Part of their Orbit; and this, with regard to the Nature of the Inhabitants, muſt be abſolutely neceſſary, if we may judge from our own Caſe; ſince, if the Sun's Diſtance was any thing remarkably variable, it is well known, that Heat in one Caſe, and Coldneſs in the other, would ſoon become intolerable; ſince Bodies of every Kind, in our Globe, are fitted only to ſuſtain one and the ſame conſtant Degrees of Heat and Cold; had the Sun, therefore, not been poſited in the Center, the Caſe of the Planets would have been much like that of the Comets, parched up with Heat, if not wholly ſet on Fire, in their neareſt Approach to the Sun, and frozen, or congealed to Stone, in their greateſt Receſs from it; in ſhort, in ſuch a Caſe, there could be no planetary Syſtem at all. Alſo this central Situation of the Sun occaſions that the Power of Gravity is at all Times equally the ſame upon each particular Planet, and that is an abſolutely neceſſary Condition for their moving in circular Orbits, or ſuch as are nearly ſo, which is the preſent Caſe of all the Planets of the Syſtem: From hence we obſerve, that every particular Circumſtance, with reſpect to the Sun, is the immediate Reſult of *Pre-determination*, *Counſel*, and *Deſign*.

III. Planeto-Theology. The *Theory of the Planets* is the next great Source of *Theological Principles*, or convincing Proofs of an infinite Power, and an all-wiſe Providence in the original Plan of this Syſtem; for if we regard them as Places of Habitation for infinite Species of Animals, and particularly thoſe of a rational and ſuperior Kind, we ſhall find all Circumſtances of each particular Planet ordered and adapted to anſwer ſuch a Purpoſe; this every Way appears from the ſeveral Parts of which our Planetary Globe is compoſed; one Part of which is *Land*, for Man and various Kinds of Animals to live thereon; and another Part *Water*, for the infinite Kinds of Fiſhes, and other Species of aquatic Animals, whoſe Nature, Form, and Parts plainly indicate, that this Element was deſigned, originally, for them;

the ſurrounding *Atmoſphere*, another Element, naturally fitted for all the winged Tribe more immediately, and alſo for animal and vegetable Life in every Creature of theſe Kinds: Alſo in the Earth and Sea we conſtantly obſerve a Diſpoſition in the Parts of Matter, (ariſing from a generical or *plaſtic Power* firſt communicated thereto) to form itſelf into all the various Species of animal, vegetable, and mineral Subſtances, and this according to one conſtant Tenor, perpetually throughout the whole Courſe of Nature. Hence it is, we ſee no new Orders of Being ariſe among us, nor any of the Old annihilated, or quite deſtroyed. And as it appears, that a Place of Habitation was the original Deſign in our Globe, we have Reaſon to think the ſame of all the Reſt: For as Nature is uniform in all her Works of the ſame Kind, and as the other Planets are ſimilar Parts with our Earth, they doubtleſs are Places of Habitation for various Species of Beings; though perhaps not the ſame, in all Reſpects, as thoſe belonging to our Earth.

This then being the Caſe, we ſhall next obſerve, that the Figure of the Planets is a Proof of the greateſt Wiſdom and Deſign; for with reſpect to Man, the principal Inhabitant, no other Figure, than that of a Globe, could have been ſuitable to have anſwered the Conveniencies of human Life; with regard to other Animals, the Figure would have been of no Conſideration, as their Manner of Life does no Way depend upon it. But Man, who was deſigned for greater Views, to act in a much larger Sphere, and to live in Society over the whole habitable Earth, finds all theſe great Purpoſes much more commodiouſly anſwered upon the Surface of a Globe, than he could have done upon a large and extenſive Plain; which muſt have been the Caſe, if the Earth had any other Figure than that of a *Globe*; a *cylindric Form* would have abſolutely rendered it unfit for Man to have paſt from one Part to the other; as the Power of Gravity would have affected him in ſuch an unequal Manner, that he could not poſſibly have attempted to have gone round, or from one Part to the other; and the ſame may be ſaid for the Form of a *Cube*, or any other irregular Figure; the prodigious Ridges and high-pointed Mountains, would have been a perpetual Bar to Society and Commerce to the Inhabitants of ſuch a figured Earth. Moreover, that according to the common Courſe of

Nature, it would be a thing impoſſible for Oceans and Seas to have had any Being in any other Figure but that of a Globe, or nearly ſo. For had there been Water, it muſt have been of a ſpherical Figure from the Nature of Gravity; and therefore muſt have over-flowed every plain Surface below it; of Courſe then, the Land muſt be every where, from the Center at leaſt, as high as the Water, and conſequently, the Land and Water together muſt conſtitute one uniform Surface of a Globe.

Upon the whole, then, we muſt conclude, that as the ſpherical Figure reſults from the equal and uniform Attraction of Gravity, (as is evident from every Drop of a Fluid, which naturally acquires that Form when left to itſelf) ſo every Planet or Body of the Syſtem muſt be of the ſame Form or Figure; and this we can eaſily prove is the Caſe of the Sun, the Moon, the Planets, and Comets, by the Teleſcope; and this Uniformity of Figure, in all the great Bodies in the Syſtem, plainly ſhews itſelf to be a *final Cauſe*, and conſequently a Proof of *Fore-caſt* and *Deſign*, and not the Work of *Chance*.

And as theſe planetary Globes were deſigned for Places of Habitation to innumerable Species of Beings, it was abſolutely neceſſary they ſhould be very large, to anſwer ſuch Purpoſes, and accordingly we find, they have all a conſiderable Magnitude, the leaſt of theſe Globes being about 2500 Miles in Diameter; and the largeſt more than 80000; and ſuch a Diſproportion in Magnitude may be obſerved, in the Size, or Bulks of the Inhabitants of each of theſe Globes reſpectively; and therefore, according to the Rules of Analogy, the People of *Jupiter* muſt be at leaſt 60 Feet high, ſince the Body of that Planet is at leaſt more than ten times as much in Diameter as our Earth; and the People in *Mercury* may be conſidered as Dwarfs in reſpect to ourſelves. Hence, not only an extenſive Scene for Action to the various Inhabitants of each planetary World is by this Means afforded, but likewiſe an Opportunity of the greateſt Variety and Diverſity in the Structure of the ſeveral Parts, to ſhew us, that the Whole is the Work of Omnipotence and infinite Wiſdom; for *Neceſſity* would produce every Thing alike, and *Chance* every Thing unlike, and fit for no Uſe at all, unleſs by Accident.

As to the Number of the Planets, this ſeems to be the Effect alſo of Deſign; for in our Syſtem, the Number of planetary Worlds, is but *Six*; for, had there been a greater Number, ſince their Diſtances in that Caſe muſt have been proportionably greater, they muſt have been all involved in great Darkneſs and Obſcurity, and their periodical Revolutions extremely ſlow and tedious. As the Caſe at preſent ſtands, the Extremes of Light and Darkneſs, of Swiftneſs and Slowneſs of Motion, among the planetary Orbs, are very great, and, as much as we can ſuppoſe, conſiſtent with general Beauty and Order, obſerved in all other Parts of Nature's handy-Works. Another thing, which demonſtrates Contrivance and Deſign, is the Form of the planetary Orbits, which are nearly circular; for thereby they are rendered much fitter Scenes for Habitations, than otherwiſe they could have been; ſince 'tis by this Form only, that they can have the Sun always at an equal Diſtance; and therefore, nearly an equal Diſtribution of his Light and Heat, as we before obſerved, was abſolutely neceſſary to qualify the Planets for habitable Worlds; furthermore, the Motions of the Planets are rendered equal, and uniform, which could not have been, if the Planet had moved in any other Orbits, but ſuch as are circular.

The Direction of the Planets Motions being the ſame among them all, while thoſe of the Comets are all different one from the other, are plainly the Effect of Deliberation and Deſign; for had they moved in different Directions, ſo near each other, and ſo cloſe to the Center, their gravitating Forces would have been conſtantly diſturbed by their mutual Attractions, which muſt have produced Confuſion, and conſtant Irregularity in their Motions, if not a total Deſtruction of the Syſtem itſelf in a ſhort Time; whereas now, ſince their Motions are in circular Orbits, and in the ſame Directions, they are ſo far from interfering with each other, and having any perturbating Forces, that they all revolve in one beautiful Choir, with great Regularity and Harmony, about the central Sun.

The next thing remarkable in the Planets, and which the Sceptic himſelf muſt allow to be a Matter of Deſign, is their Rotation about their Axes, or what is called their *diurnal Motion*; for this no ways follows from their *annual Motion*, but is ſtill abſolutely neceſſary for the comfortable Exiſtence, or Well-being of their Inhabitants; for, without this wiſe Proviſion, they would ſome of them have always been in the enlightened Hemiſphere, while the other half, deprived of the Bleſſing of the ſolar Beams, had been abandoned to utter Darkneſs, and doomed to one eternal Night; a Diſparity, in the Proceedings of Providence, never to be ſuppoſed, or ſuſpected: 'Tis true, the Periods of this diurnal Motion, are of an unequal Duration, being ſome of a longer, and others, of a ſhorter Continuance; in our own Planet, the Earth, it laſts nearly 24 Hours; by this Means, we have the neceſſary and uſeful Alternation of Day and Night; the one for Exerciſe and Labour, the other for Reſt and Refreſhment, by which are ſupplied the neceſſary Recruits of Nature: And ſuch is the Caſe, no doubt, of the other planetary Inhabitants.

Again, ſuppoſing a diurnal Motion; that is not in itſelf ſufficient to compleat the Felicity of the Inhabitants; for ſuppoſing each Globe were to revolve about the Sun, upon an Axis perpendicular to the Planes of their Motion, then would their Days and Nights be for ever equal, and the Seaſons of the Year invariably the ſame to the Inhabitants of each reſpective Part; but to obviate this diſagreeable *Sameneſs* of Things, and to afford that requiſite and uſeful Variety (and which every rational Creature is naturally formed to delight in) the wiſe Contriver of the Whole has, in the beſt Manner, adapted every Part; and ſo, among other Inſtances of his Regard, he has given to the Axes of the Earth, and other Planets, an *oblique* Poſition, by which Means, the Days and Nights become conſtantly unequal, and we enjoy the beautiful and four-fold Variety of Seaſons, and reap all the Advantages of *Spring*, *Summer*, *Autumn*, and *Winter*, in each revolving Year.

But the Maſter-Piece of divine Mechaniſm, in the Conſtruction of the planetary Syſtem, and that which, above all Things beſides, declares the Omnipotency and boundleſs Wiſdom of the Architect, is the conſtituting, and rightly adjuſting thoſe ſtupendous Powers, by which thoſe planetary Bodies, of different Magnitudes and Diſtances, are made to revolve in ſo conſtant and uniform a Manner about the Center of Force. The Powers we here ſpeak of are of two different Kinds, one of which is called the *projectile Force*, by which, if it acted alone, it would be carried out of its Orbit in a right Line; the other is a centripetal Force, which acting alone, would carry the Body directly down to the Center: Now, every Body that moves in a Curve about a Center, muſt have its Motion produced and regulated by a Compoſition of theſe two Forces, and there is one particular Ratio only, in which they can be ſo combined as to produce a circular Motion; for were either of theſe Forces to be greater or leſs than it is, for any given Diſtance of a Planet, that Planet would always recede from, or approach to the Sun, and ſo render the Planets unfit for the Purpoſes they were originally deſigned to anſwer. But we ſhall proceed farther in this important Particular, when we come to treat of the Motion of the Comets.

IV. SELENO-THEOLOGY; or the Doctrine of the *Satellites*, or *Moons*, which afford us a copious Syſtem of Theological Principles; for as theſe are a Sort of ſecondary Planets, which revolve about the primary ones, by the ſame ſtated Laws of Motion as they do about the Sun, it follows in general, that the ſame Power and wiſe Conduct has been employed in their original Inſtitution, as we have before obſerved, in regard to the Motion, Magnitude, and Diſtances of the principal Planets; for they are moved by the ſame Laws of a projectile and centripetal Force, in Orbits of a circular Form; all in the ſame Direction from the Weſt to the Eaſt; at different unequal Diſtances from the Center, and of large and different Magnitudes, correſponding to thoſe of the Primaries, and in different Numbers, as their Nature and Uſe require. For, the Deſign of a Moon was to illuminate the primary Planet, to the End that in the Sun's Abſence, or Night-time, it might not be left totally dark; thus, where no ſuch Moon-light is required, we find no Satellite, or Moon, as in the remarkable Caſe of *Mercury* and *Venus*, which being placed in the denſer Part of the ſolar Rays, have the Light of their Atmoſphere undoubtedly ſo great by Night, as to render a lunar Reflection unneceſſary in thoſe glowing Orbs. But the Earth, whoſe Situation is aſſigned at a greater Diſtance, has the Light by Night ſo weak, as to require, in ſome Meaſure, the Uſe of a Moon; and accordingly we find, that indulgent Providence has ſupplied it with one, which alone anſwers all our Purpoſes. *Mars* is ſtill further removed from the Sun, 'tis true, and yet has no Moon; but this can be no Objection againſt a lunar Inſtitution, becauſe, that Planet is of a peculiar Make from any of the Reſt, as is evident from his red Aſpect, by which it is plain, the Matter of that Planet reflects more of the red-making Rays of the Sun, than that of any other Planet, which all appear of a white Light; and theſe red Lights may be detained in the Atmoſphere of *Mars*, in order to render a Moon uſeleſs: Or, it may be, the Inhabitants of that Planet may have their Eyes ſo formed as to ſee with a much leſs Degree of Light than is neceſſary for us; for a free, wiſe Agent may not always chuſe to execute all his Deſigns upon the very ſame Plan, though he may have the ſame Things in View, in them all.

The next Planet, *Jupiter*, which is much farther removed from the Fountain of Light, is accomodated with no leſs than four Moons, which it muſt be ſuppoſed were to illuminate that huge Planet in its darkſome Tour from the Sun; and in the Planet *Saturn*, we obſerve no leſs than five, beſides a very large Ring, encompaſſing the Body of that Planet, which extraordinary Apparatus muſt be certainly deſtined for the common Purpoſe of reflecting Light on the *Saturnian* Inhabitants, in their very diſtant and dreary Situation, where the Light of the Sun is near a hundred times leſs than with us.

But another grand, if not the principal Deſign of a Satellite, or Moon, is to agitate, or give Motion to the Fluids of their primary Planets; at leaſt, this is well known to be the Caſe of our own Moon; whoſe Influence is abſolutely neceſſary, and is the ſole Cauſe of Motion in the Waters of our Oceans, producing the Tides, or the Flux and Reflux of the Seas, by which Means, the Waters are kept pure and wholeſome, and are rendered much more ſerviceable for the Purpoſes of Navigation. The ſame Thing we obſerve, with Reſpect to the Atmoſphere, or Body of fluid Air; which, as it is leſs denſe than Water, by many hundred Times, ſo the Agitations, or Tides, occaſioned in it, by the Moon, will be in Proportion greater than thoſe of the Ocean, and this Motion of the Air is abſolutely neceſſary to render it ſalubrious, or fit for animal, or vegetable Life; all which is evident, by too common Experience of ſtagnant Fluids of every Kind, which, by that Means, always putrify, and prove mortal to every Creature that moves in them; and this we may ſuppoſe to be the Uſe of the Moons, alſo in *Jupiter* and *Saturn*, and, perhaps, in a more extenſive and higher Degree. In the laſt Place, theſe ſecondary Planets may alſo be deſtined for the Habitation of different Species of Animals, and other Kind of Beings: Since they are all of them of a very large Bulk; many of thoſe belonging to *Jupiter* and *Saturn*, are bigger than our Earth, and, none of them much leſs than the two primary Planets, *Mercury* and *Mars*. Upon the Whole then, we have Reaſon to conclude, that the ſecondary Planets make the ſecond great Order of the Creation, and are wonderful Inſtances of a benign Providence and Goodneſs, and by no Means the fortuitous Production of Chance.

V. COMETO-THEOLOGY; the late Diſcoveries made in the Aſtronomy of Comets lay open to our View the moſt wonderful and amazing Scenes of Omnipotence, Wiſdom, and Providence, that the whole Theatre of Nature affords; whether we regard the Matter or Subſtance of which they conſiſt, the Powers by which they are moved, the Manner and Form of their Motions and Orbits which they deſcribe, or their extreme Velocities and periodical Revolutions.

As to the Subſtance of the Comets, it is, beyond all Diſpute, the moſt ſingular and extraordinary that we find in the Compoſition of any Body in Nature; for there is no Body beſide, in which we obſerve two ſuch extremely oppoſite Properties of Matter, *viz.* its being *fixed* on one Hand, and *volatile* on the other, in a Degree, which ſurpaſſes all Imagination; and who does not immediately ſee, that this is abſolutely neceſſary in the Nature and State of a Comet, and therefore the plaineſt Effect of Counſel and Deſign? For had the Matter of Comets been the ſame that we find in other Bodies, each Comet in its Approach to the Sun, would have been gradually diſſolved, or diſſipated into Fume and Vapour, and ſo their whole Nature and Frame have been deſtroyed; for tho' the moſt fixed Body that we know of in Nature, which is Gold, will endure the utmoſt Heat of a Glaſs-Houſe-Fire, for Years together, without the leaſt Diminution; yet it will be vitrified, calcined, and volatilized all away in the intenſer Heat of a Burning-Glaſs, which is not by many Million of Times ſo great as the Heat of the Sun, which ſome of the Comets are obliged to undergo in their neareſt Approach to it; from whence it may be eaſily conjectured to what a ſtupendous Degree, the Particles of the Comet muſt be in one Part fixed and permanent, not to be moved or altered by ſuch an inexpreſſible Degree of Heat.

On the other hand, when we conſider the extreme Volatility and Inflammability of other Parts of its Subſtance, we ſhall find our Reaſon equally at a ſtand, if we attempt to form a juſt Idea of it: Theſe Parts begin to move with ſmall Degrees of Heat, and greater Quantities are volatilized, as the Comet paſſes thro' greater Degrees of Heat, till having reached, and ſomewhat paſſed the Perihelion, or neareſt Diſtance from the Sun, amazing Quantities of this ſubtile Matter, become ignified, and are made to aſcend in that enormous Flame, or Pillar of fiery Vapour, that conſtitutes what we call the Tail of a Comet; as we are not hitherto acquainted with the Deſign, or Ends to be anſwered by the Comets Formation, we cannot ſay to what Purpoſe this different Diſpoſition of the Matter in a Comet may be applied; it is ſufficient to know, from all its Circumſtances, nay we muſt neceſſarily conclude, that it is the immediate Reſult of the omnipotent *Fiat* of a Deity.

In the next Place, the Form of the Comets Orbits highly deſerves our Attention; for, though they are of the ſame Kind with the planetary Orbits, *viz. Ellipſes*; yet are they juſt in the contrary Extreme; for, as the *planetary Ellipſes* differ very little from Circles, thoſe of the Comets are as much elliptical, or eccentric as poſſible; yea, ſome of them have the Sides of their Orbits but little different from parallel ſtrait Lines. The Comet's Orbit, that is leaſt of all elliptical, goes to a Diſtance, near ſeventy Times farther from the Sun at one Time, than another; and that which is moſt of all elliptical has its greateſt Diſtance from the Sun, more than twenty thouſand Times at the leaſt; therefore, upon the Whole, it appears, that ſuch a great Variety, in the two Extremes of elliptic Orbits, muſt be the plaineſt Indication of infinite Wiſdom and Deſign.

From the ſame Conſideration, it muſt alſo appear, that the omnipotent Power muſt neceſſarily be concerned in producing Motion in Orbits of ſo wonderful a Form; ſince the Motion of every ſuch Body muſt reſult from a Competition of two Forces, one of which is a uniform, projectile Force, and the other, a central Force, or ſuch as tends to the Center of the Sun, and which is always variable, decreaſing conſtantly as the Squares of the Diſtances increaſe; and therefore, though in one of the Orbits, it is four hundred Million of Times greater upon the Comet, in one Part of the Orbit than in another, yet, notwithſtanding all this prodigious Inequality of Force upon the Comets in general, they all move with the utmoſt Regularity, and Harmony.

The *Velocity* of their Motions is another engaging Conſideration; for that is every-where variable through the Orbit, and at each End of it, in a ſurpriſing Degree, in that Comet where the Difference of the Velocities, when neareſt and fartheſt from the Sun is leaſt of all, it amounts to a greater Diſproportion, than that of five Thouſand to One; and in another Orbit, the Comet moves four hundred Million of Times faſter, when he is neareſt the Sun, than when he is fartheſt from it. How wonderful muſt ſuch Extremes of Velocity be, and yet, how nicely reſulting from the ſtated Laws of Motion, by which the whole Syſtem is governed!

The Periods of cometary Revolutions next raiſe our Admiration; a different Deſign here ſhews itſelf from that, by which the planetary Motions were directed, the longeſt Period of a Planet being not half the ſhorteſt Period of a Comet, and what a wonderful Variety we again obſerve in the Periods of the Comets Motions, one performing its Courſe about the Sun, in 75 Years, and another requiring more than five hundred and 75 to perform its darkſome and ſolitary Tour!

The moſt magnificent and auguſt Idea of the mundane Syſtem chiefly ariſes ſtill, from a View of the Number, and Grandeur of the cometary Orbits, in Compariſon of which the whole planetary Syſtem is but a Trifle, and almoſt vaniſhes. We have already obſerved no leſs than about 40 of thoſe cometary Orbits, and many undoubtedly remain for the Diſcovery of future Ages, from whence it appears, that a ſmall Part only of the Syſtem is as yet known to us, and that but imperfectly.

The Direction of the Motion of the Comets in their reſpective Orbits is the ſame with the Planets, *viz.* from Weſt to Eaſt; but the Poſition of their Orbits very different, and their longer

Axis pointed to all Parts of the Heavens, indifferently; whereas the Planets move not only all the ſame Way, but almoſt in the ſame Plane, *viz.* that of the Earth's Motion; and here we may more particularly admire the wonderful Proviſion made for the Preſervation and Security of the planetary Syſtem, by placing the Orbits of all the Comets in different Planes from that of the Planets, by which Means they traverſe the Syſtem in all Directions, and without the Danger of interfering one with another, or with any of the Planets: Had they moved in the Ecliptic, that is, in the Plane of the Planets Motion, we ſhould have had juſt Reaſons, not only to have feared being frequently involved in their fiery Tails, but to have expected likewiſe a terrible Shock from the Bodies of the Comets themſelves; for in that Caſe, the numerous Orbits of the Comets, lying acroſs the Orbits of the Planets, we could not have been exempted from thoſe terrible Intercourſes now mentioned, by which the Bodies of the Planets would undoubtedly have been demoliſhed, and probably long before this Time, the whole planetary Syſtem might have ceaſed to exiſt; but as the Caſe now ſtands, we are delivered from any ſuch formidable Events; for now the Orbits of the Comets (be they ever ſo many) will carry the Comets in their Return through the planetary Syſtem, at a ſufficient Diſtance from the Bodies of the Planets, nor is there more than any one Point in any of the planetary Orbits in which the ſaid Planets can be invelloped in their Tails. Upon the Whole then, we ſee how greatly the Power, Wiſdom, and Goodneſs of the divine Architect of the mundane Syſtem is diſplayed, in the providential Conſtruction and Deſtination of every Part thereof. This will be ſtill more evidently manifeſt, from a large Print, intitled, *The Wonders of the cometary World diſplayed,* in five new Views of the mundane Syſtem.

VI. Astro-Theology; The Science of the Stars, is a boundleſs Theme, and productive of innumerable Demonſtrations of a Deity; here the Attributes of Omnipotence, infinite Wiſdom, and Providence, are diſplayed in a moſt amazing Degree, not ſingle Scenes, but the wonderful Theatre of Nature itſelf is here diſcovered to the Eye of Reaſon, with its grand and immenſe Apparatus, central Suns, and Syſtems of planetary

Worlds.—When we viewed the Globe of our Earth, it appeared inconſiderable, in Compariſon of *Jupiter*; this Planet alſo, compared with the Sun, is diminutively ſmall; the Sun itſelf, in Compariſon of the planetary Syſtem, is but a Point; and this Syſtem, yet how ſmall, in Compariſon of the cometary Field! But how is our Reaſon confounded, when we recollect, that this grand and mighty Fabric of planetary and cometary Worlds is leſs than a Point, and intirely vaniſhes at the Diſtances of the fixed Stars? We are ſufficiently inſtructed in the Truth of all this by the little Philoſophy we have of ſuch diſtant Objects; for we are thereby taught, that every fixed Star we ſee is undoubtedly a Sun, and conſequently, the Center of a Syſtem of planetary Worlds, and that theſe are found every where, at proper Diſtances from each other, through the boundleſs Univerſe of Space; for Reaſon tells us, that our own Sun, removed to a greater Diſtance, would appear much leſs, and at 10 Times the Diſtance, would appear a 100 Times leſs, and when removed to a ſufficient Diſtance, the whole apparent Surface would dwindle into a twinkling Point, or would make the ſame Appearance to us as a Star, and we ſhould reckon it one of that Number; but if the Diſtance was ſtill much more increaſed, that luminous Point would totally diſappear, and we ſhould know of no ſuch Body exiſting in Nature, any more than we do now of thoſe fixed Stars that never appear to the naked Eye. The ſurpriſing Diſtance of the neareſt fixed Star exceeds the Power of Calculation; for no fixed Star has a Parallax, which is of one ſingle Second, which is only in other Words, to ſay, that the Diameter of the Earth's Orbit, (which is a Hundred and ſixty Millions of Miles in Length) does not ſubtend ſo very ſmall an Angle at the Diſtance of the ſaid Star, but vaniſhes into a Point; ſo that though the Velocity of Sound be ſo very great as 1142 Feet *per* Second, or ſeven Million of Miles *per Annum*, it would take up no leſs than four Million five Hundred and ſeventy Thouſand Years in paſſing from us to a fixed Star, even ſuppoſing it near enough to have the Parallax before mentioned; from hence every reaſonable Perſon muſt neceſſarily conclude, that at that immenſe incomprehenſible Diſtance, two Things will be neceſſary to render any Body viſible to our Eyes. The firſt is a prodigious Magnitude or Bulk; and the ſecond a pure and innate Light; for Light, without a ſufficient Bulk, could never ſhew an Object at that Diſtance, and though Bodies were ever ſo large in Bulk, without a proper and innate Light, that is to ſay, unleſs they were Bodies of pure Light and Fire, they could not be ſeen at a 1000,000th Part of the Diſtance of a viſible Star, therefore every Star is a Body of an immenſe Bulk and a pure Light, and therefore the ſame with our Sun, and if they are Suns, then are they Centers of ſo many Syſtems of planetary Worlds.

For it is an eſtabliſhed Maxim, founded on Experience, that nothing in Nature was made in vain, and that all the Works of Nature of the ſame Kind were deſtined to anſwer the ſame Ends and Purpoſes; the Stars, therefore, are thoſe glorious Bodies, which, by their Light and Heat and central Forces, govern and regulate the Motions of the reſpective planetary Bodies, and prove the natural Means of Motion, Life, and Vigour, to all their various Inhabitants, and every Thing likewiſe that may be neceſſary for the Life and Growth of Vegetables, Foſſils, and other ſuch like Bodies. Theſe Stars, for what we know, may be infinite in Number, ſince by a Teleſcope they appear more numerous than to the naked Eye, and ſtill more ſo in Proportion as the Teleſcope has a greater magnifying Power; ſo that it is not to be doubted, but that if a Teleſcope could be found, whoſe magnifying Power was infinite, ſuch Stars would then be diſcovered through all the Infinity of Space; the Univerſe, therefore, is beyond all Diſpute replete with central Suns, and Syſtems of planetary Worlds, all placed at an immenſe Diſtance from each other, at the ſame Time, that the gravitating Forces of one might not interfere with, or diſturb the Motions of another; ſuch is the great and noble Idea we ought to entertain of the Works of the Author of Nature, whoſe Power and Wiſdom are infinite, and to whom it muſt be ſuppoſed as eaſy to form Myriads of mundane Syſtems as one. Thus we ſee how excellently well the Pſalmiſt has expreſſed himſelf, when he ſays, (in *Pſalm* xix. 1.) *The Heavens declare the Glory of God, and the Firmament ſheweth his Handy-works.* To this we ſhall only ſubjoin the Remark of a wiſe Heathen, *(viz. Cicero)* “ wherefore, ſays he, whoever thinks, that the admirable Order and incredible Conſtancy of the heavenly Bodies and their Motions, whereupon the Preſervation and Welfare of all Things depend, is not governed by Mind and Underſtanding, he himſelf is to be accounted void thereof."

VII. Aero-Theology. The Atmoſphere, or Body of Air encompaſſing the Earth, is a copious Theme and pregnant with theological Principles, in as much as it is fitted in every Part to anſwer all the great Ends and Purpoſes of animal and vegetable Life, the Production of Meteors, and for being a proper Medium, or Element for the winged Tribe, the peculiar Nature and Conſtitution of the Parts of Air require our utmoſt regard. Its moſt diſtinguiſhing Property of Elaſticity is an Argument of infinite Wiſdom and Deſign; for the Parts of fixed Bodies muſt be firſt ſeparated, then made to repel each other, and thus become an elaſtic Fluid; this Quality of the Air muſt always be variable to anſwer the Ends propoſed by it, and this is effected by the variable Weight, or Gravity of the Air, in different Heights above the Earth; for where the Weight of the Air is greateſt near the Surface of the Earth, there will the Particles be compreſt nearer together, and conſequently the Denſity of the Air will be there greateſt of all; and as the Weight of the Air decreaſes, and its compreſſing Force, the Denſity of the Air will alſo decreaſe in Proportion, and at laſt become nothing at all.

This Fluid is appointed the natural Means of Life to Men, Beaſt, and Fowls, in the common Action of Reſpiration; for it is naturally fitted by its Weight to ruſh into the Lungs of Animals, and to expand them; by which Means ſomething is thereby communicated to the Blood, circulating through the Lungs, which we may properly call a *vivifying Spirit*; ſince it is well known, that without a conſtant Supply of Air in this Manner, ſuch Animals do immediately expire, which is alſo the Caſe, when the Air is deprived of this neceſſary and enlivening Principle, in paſſing through a charcoal Fire. Nor is the groſſer and denſer Air more neceſſary to larger Animals, than the more ſubtil and ethereal Part to the numberleſs Tribes of leſſer Animals, and even to Fiſhes themſelves which live in Water. That the Air affords the Pabulum of Life to every Kind of Animal is from hence evident, that there muſt be always a freſh Supply of it, in order to ſupport Life in each; for conſtantly the ſame, or confined Air, proves preſent Death to moſt, and in Time to all.

As to *vegetable Life*, it is well known, that Air is the immediate Support of it, as it is ſhewn by Experiment, that Vegetables of any Kind in an exhauſted Receiver, or even long remaining in confined or ſtagnant Air, loſe all their Glory and Verdure, and by Degrees, ſicken, languiſh, and die away.

By the Elaſticity of the Air, it becomes the natural Means of Flight to Birds; for they, by their expanded Wings, ſtrike the Air, and that, by its Re-action, gives them a very great Power to move through it, and to convey themſelves from any one Part to another with great Facility and Velocity of Motion. Not only Birds, but innumerable Species of the Inſect-kind depend upon the Element of Air, for the Means of Paſſage and expeditious Motion; add to this, that Myriads of different Kinds of *Animalcula* which by their extreme Minuteneſs eſcape the Sight, have their Exiſtence in this fluid Medium.

The Air, by its elaſtic Force, is by Nature fitted for the Medium of Sound; ſince the Parts of a tremulous, or vibrating Body, being put into Motion by a Stroke, thoſe moving Parts will ſtrike the Parts of Air next to them, which, by Means of their elaſtic Force, will put the next contiguous Parts of Air in Motion, and they the Particles next to them, and ſo on, till thoſe ſucceſſive Pulſes of Air, propagated all around like Waves on the Surface of Water, at length reach the Drum of the Ear, which by this aerial Impulſe is put into Motion, together with a curious internal Mechaniſm of Bones, and thereby the internal Air in the Ear is moved and modified in ſuch a Manner, as by its Action on the auditory Nerve, all the Ideas of Sound are variouſly excited and raiſed in the Mind moſt certainly by a Power Divine, ſince it is far enough above all human Comprehenſion.

In the next Place, we are to conſider the Air as an immenſe fluid Body, whoſe Parts would all among themſelves naturally tend towards a perfect *Equilibrium*, or State of Reſt, but this is by no Means ſuited to the preſent State of animal or vegetable Bodies; for a ſtagnant, or a motionleſs Air is always found pernicious, and if but a ſhort Time continued ever proves mortal; therefore it was abſolutely neceſſary, that the Air ſhould be always in Motion, and ſecondary Cauſes are ſufficiently ſupplied for that Purpoſe. The Motions of Air by them produced are what we call WINDS; theſe ſhew a conſtant Agitation of the

Air, and of Courſe its Salubrity to all animated Nature; theſe Winds, or various Motions of the Air, are neceſſary on another Account, *viz.* to waft the Meteors from one Part to another, in order to ſupply the various Occaſions of the Earth and Seas below; and in the laſt Place, every one muſt know, that the Art of Navigation wholly depends upon theſe Winds, or Torrents of Air, to fill and impel their Sails, and move thoſe heavy Bodies, over the liquid Surface of the Main; ſuch wonderful Wiſdom we ſee employed in the natural Production of Winds.

With Reſpect to the Meteors, as they are abſolutely neceſſary in the preſent State of Nature, ſo the Atmoſphere is manifeſtly contrived for their Formation; for they all originally reſult from the Particles of ſolid and fluid Bodies, ſeparated, evaporated and ſublimed into the Air, in which, as there are various Degrees of Denſity, or ſpecific Gravity, it will, at a certain Height, be the ſame with that of the Vapours ſo raiſed, where they will be ſupported, and appear in the Form of Clouds, and carried from one Part to another by the Motion of the Air, or Wind. Here, from various Cauſes, the aqueous Particles will be often condenſed, rendered heavier than the Air, and deſcend in *Showers of Rain*; ſometimes they only hover about us in the lower Parts of the Air, and make the *Fogs and Miſts*; in the upper Regions of the Air, where nitrous Salts abound, they are thereby cryſtallized, and fall in *Fleaks of Snow*; higher yet they are carried by a heavier Air; and there, by a more intenſe Degree of Cold, they are congealed into the harder Subſtances of *Hail-ſtones*; in the ſame Manner the Parts of ſulphureous and bituminous Matter being ſublimed into the Air, will foment with the Nitre, and often kindle into a Flame, and produce the Flaſhes of Lightening; when this happens to be the Caſe through moſt of the viſible Hemiſphere, it is then called the *Aurora Borealis*; when this Accenſion happens to be in a Cloud, the expanſive Force is ſo great upon the circumambient Air, as to produce a violent Exploſion, or the tremendous *Strokes of Thunder*. From all which we muſt be fully convinced, how far even infinite Power and Wiſdom muſt be employed to produce ſuch wonderful Effects from ſo ſimple an Apparatus of ſecondary Cauſes.

Another Property of the Air is an Inſtance of a ſingular Providence and Deſign, and that is the great Subtilty of the Particles of Air, by which Means they become perfectly inviſible to the Eye, and therefore the whole Body of the Atmoſphere will be rendered tranſparent or diaphanous, and on this Account alone it is, that we are enabled to ſee all Objects clearly and diſtinctly about us, which would have been more or leſs obſcured by the Viſibility of the Particles of Air.

Moreover, the Bleſſings of Light and Heat are derived from, and preſerved to us by the *Medium* of Air; for though Light originally proceeds from the Sun, yet it would have been loſt to us, were it not for the Body of Air which detains the Sun-beams, at leaſt a good Part of them, and thereby renders all Objects viſible to us; for the Parts of Air, though they repel each other, yet they ſtrongly attract the infinitely finer Particles of Light in their Paſſage through it. Theſe render the viſible Hemiſphere luminous and bright, and prevent, in a great Meaſure, abſolute and total Darkneſs, even in the Night. Without this wiſe Proviſion, our Days and Nights had been undiſtinguiſhed, and made one conſtant Scene of eternal Darkneſs and Horror; for we muſt, in this Caſe too, conſider, that all that genial Warmth and Heat, which animate the whole Syſtem of Nature, would then have been greatly deficient, and conſequently the Air, upon theſe Accounts, is the moſt neceſſary and important Subject of Nature.

Once more, when we conſider how neceſſary Fire is upon all Occaſions, and the Fire and Flame abſolutely depend on the Air, it is a farther Inſtance and Proof of the abſolute Neceſſity of ſuch a Medium. Upon the Whole then it appears, that the Atmoſphere is the moſt wonderful, the moſt uſeful, and the moſt neceſſary of all the Works of Nature.

VIII. HYDRO-THEOLOGY; The next great Subject in Nature, that every way proves to us, that, the utmoſt Wiſdom and Deſign was employed in the Formation of the Globe, is the *Element* of WATER, which makes by far the largeſt Part of its Surface. Here final Cauſes pour in upon us from every Quarter, reſiſtleſs as the Tides of the Ocean itſelf; for if we conſider the Nature of Fluidity, we muſt ſoon underſtand, that, a peculiar Figure of the Particles of Matter, is neceſſary for that Purpoſe, and this we find they have in great Abundance, ſo far as to anſwer every Purpoſe in Nature: By the Fluidity of theſe Particles, a proper Element is conſtituted for a Medium of Habitation, or Life, for numberleſs Kinds and Species of Fiſhes, and other Sea-Animals; and in this Element, we find the two Extremes of Almighty Power in the Formation of Animal Bodies, the enormous Size of Whales on the one Hand, and *Animalculæ* eluding the Sight on the other, in degrees of Miniature beyond all our Reſearches. Again, the Ocean, every one knows, is the Baſis of Navigation: The Water, by its Buoyancy, ſupports the heavy Burthens and Bodies of Ships, and by its Fluidity, affords them an eaſy Motion through it, when impelled by the Wind in every Direction poſſible; by this Means, we traverſe the liquid Main, lay open a Communication, and carry on Trade and Commerce with all the foreign and diſtant Nations of the World, and that, with the utmoſt Eaſe and Expedition: Now had this Element been wanting, or the whole Surface of the Earth conſiſted of Land only, all ſuch Community with our Fellow-Creatures abroad would have been rendered, if not impoſſible, yet ſo difficult, dangerous, and tedious, as not to have been feaſible; conſequently the State of every Nation would have been low, poor, and ignoble, and little better than that of the *Indians*, or *roving Arabs*. To anſwer thoſe great Purpoſes, we obſerve how wiſely it is ordered, that the Waters of the Sea ſhould be always in Motion, and alternately *Ebb* and *Flow*; by this Means, too, it is provided, that this mighty Collection of Waters is always kept pure and wholeſome; to which End, we may add the admirable Contrivance of its *Saline Quality*, and that this Admixture of Salt renders the Water ſtill more *Buoyant*, and therefore fitter for the Purpoſes of Navigation.

We have already obſerved how neceſſary the Meteors are in the preſent State of Nature; but whence do they ariſe, or from what Source are they produced? The Anſwer is very eaſy; altogether from the Ocean; from this univerſal Ciſtern, heated by the Sun, the ſuperficial Particles are conſtantly ſeparated and evaporated into the upper Regions of the Air, where they form the Clouds, and thence our Showers of Rain, thence alſo our Springs, Fountains, Lakes, Rivers, Wells, &c. all which are ſo neceſſary, that no Kind of Life, or Buſineſs could ever proceed without them; on Rains almoſt all vegetable Growth depends, and the Nouriſhment both of Plants and Animals, conſiſts of fluid Parts; we need not mention, that no Sort of Buſineſs or Manufacture could poſſibly be carried on without Fluids in various Kinds, and Forms, of which the moſt univerſal is Water.

In the Sea alſo, we find a prodigious Variety of curious vegetable Productions, which will grow in no other Element, in Forms and Colour, vying with the moſt Beautiful the Land produces; add to theſe, an endleſs Diſcovery of *Corallines*, *Lithodendrons*, and other Sub-marine Productions through all the capacious Deep, where perhaps we may diſcover more numerous and ſtriking Inſtances of Divine Power, Providence, and Pleaſure, than in any other Part of the Creation.

IX. GEO-THEOLOGY; We have heretofore conſidered the Globe of our Earth in the Character of a Planet, and as a habitable World in general, but we ſhall now proceed to a more particular Examination of the ſeveral Parts of which it conſiſts, to conſider how well they are contrived and diſpoſed to anſwer the great Deſign; and in the firſt Place, we ſhall take notice of what offers to our View in the exterior Part, or Surface of the Land, with regard to any particular Place, and for all the viſible Extent about it; and here we find a wonderful Variety of Mountains, Hills, and Vales, of Lakes, Rivers, and Fountains, of Trees, Shrubs, and Plants, of Earths, Foſſils, and Minerals, of Men, Quadrupeds, Fowls, Fiſhes, Reptiles, Inſects, and numberleſs Species of Animals without a Name, in all which we ſee the Veſtigia of Deity ſo plainly impreſt, that the whole appears to be a moſt harmonious Syſtem of animated and divine Mechaniſm.

Mountains, Hills, and Vales, diverſify the Surface of the Earth, and theſe are indiſpenſibly neceſſary to the Well-being of all its Inhabitants; for Ridges and Chains of Mountains ſerve not only for Barriers to the different Kingdoms and Countries, and common Hills for *Shelter* and *Paſturage* for Cattle, but the great Deſign in all this wonderful Apparatus, is the Production of *Springs* and *Rivers*; for we ſcarcely now find any one ſo much a Novice in Natural Science, as not to know when he ſees a River, that its Waters muſt move from a *high* to a *lower* Place, and conſequently, that without Mountains and Valleys, there could have been no ſuch Thing as Rivers, or Currents of Water at all, which all originally proceed from Springs, and theſe from Waters, collected from falling Rains, melted Snows, condenſed Vapours, *&c.* in Receptacles and Ciſterns, in the interior Parts of the Mountains above them. Had the Surface of the Earth been every where even, or equally diſtant from the Center, the Waters then had been every where ſtagnant, or without any Motion, and have been fitted for little or no Uſe at all. By the Rapidity of deſcending Waters, they work themſelves deep Channels thro' the Surface of the Earth, and are thereby accommodated to the various Uſes of Mankind.

The GLEBE, *Mould*, or *Earth*, which makes the exterior Surface of the Land, is ſo diverſified, and thereby ſo evidently accommodated to anſwer all the Purpoſes of Vegetation, particularly with Regard to Graſs, and Grain, and this being always the Caſe for every Country in every Climate of the Earth, it muſt be acknowledged to be a Matter of infinite Wiſdom, and the plaineſt Proof of Contrivance and Deſign; for, if Wheat requires one Sort of Earth, Barley another, Oats, and Beans another, Carrots, Turnips and other uſeful Roots, their different Soils; and if Hops, Fruit-trees, Timber-trees, *&c.* are found to flouriſh beſt in their peculiar Moulds, and all theſe Earths, Soils, and Moulds, are every where found for thoſe Vegetables, then we have all that we could aſk or expect from the Hands of a wiſe and provident Benefactor; for from thence we find a moſt ample Proviſion made for Food and Diet, to Man and Beaſt, not only ſo far as the Neceſſities of Appetite require, but even to Pleaſure and Luxury itſelf. And it is very remarkable, that the Thickneſs or Depth of the Mould, is almoſt every where ſuch as is required, and nothing more.

Then it is found by Experience, that the Principle of Vegetation in all its different Kinds, and which is naturally contained in the Glebe, is yet ſubject to be exhauſted by every freſh Crop of Corn, Graſs, or Fruit, and conſequently, requires to be frequently ſupplied. This lays the Foundation of *Agriculture*, and requires the conſtant Care and Attention of the Huſbandman; he is obliged to look about him for ſomething that he muſt find annually to improve, and fertilize his Land, and provident Nature has here indulged him with a large Supply; for juſt beneath the Glebe, let him only dig, and he will find all the Variety of *Manure*, that the Nature of his Lands require; he there finds Marl, Chalk, Loam and other fructifying Subjects of the Foſſil-kind; beſides theſe, we find other different Kinds of Earths, for anſwering different Exigencies of Life; thus, Clay in Abundance is furniſhed for making Bricks for Building; the Potters Clay is a well-known neceſſary Article for a great Variety of Utenſils; the Fuller's Earth, and many others which we might Name, moſt evidently ſhew how particularly Providence has conſulted, not only the Neceſſities, but even the Conveniencies of Life.

The next component Parts of the Earth are *Stones* of various Kinds; the largeſt and moſt common Sort conſtitute, for the moſt Part, our Rocks, which afford us ample materials for Buildings of the largeſt Sort, as Temples, Churches, Palaces, Bridges, &c. then we find Rocks of *Slate* to cover them; after this, we meet with Rocks of *Chalk*, and *Lime-Stone*, for Cements, to bind and faſten the whole together; then we obſerve a great Variety of *Flints*, *Pebbles*, and *common Stones*, which, as it is well known, are of very great Service to Mankind; but eſpecially, when we come to reflect on the great and rich Variety of precious Stones, the *Cryſtals*, the *Pearls*, and the *Diamonds*, we may from thence eaſily judge, that Nature could have nothing leſs in View, than the Grandeur and Honour of the higher Ranks of the human Race, who muſt be diſtinguiſhed from Inferiors by proper Enſigns and *Regalia*; hence the Ornaments and Brilliancy of Dreſs, and the ineſtimable Value of *Crowns* and *Diadems*.

The next Sort of Bodies that we meet with in the Bowels of the Earth, are various Kinds of *Marcaſites*, all poſſeſſed with very uſeful Qualities and Virtues; witneſs the *Magnet*, the Baſis of one of the moſt neceſſary Arts of Life, *viz.* *Navigation*, and was therefore undoubtedly given us for that Purpoſe. Native Cinabar ſupplies us with a rich Medicine, when reſolved with Quantities of *Mercury* and *Sulphur*. *Antimony* is another uſeful Drug in Medicine; beſide many others of the Foſſel-kind too numerous to recount.

In the laſt Place, we muſt take notice, that from the Earth we are ſupplied with all thoſe uſeful Subſtances we call **Metals**, in various Forms of Ore; and it is very remarkable, that the Seeds of *Metals* are not ſown equally through the Earth, but in few Places only; ſome Places we find productive of *Lead*; a very few of *Tin*; many more of *Iron*; in a few Places, we find *Copper*; and if we take the Pains to examine diſtant Climates, we ſhall there find, by the greater Heat of the Sun, the Particles of metalline Earth meliorated and ripened into the richer Ores of *Silver* and *Gold*, to reward us for our Trouble; and when we conſider how univerſally uſeful, and even neceſſary, thoſe metalline Subſtances are in every Way of Life, as in regard to Utenſils and domeſtic Furniture, *Architecture* and Buildings of every Kind, their general Uſe in Medicine, in almoſt all Kinds of Manufactures and Trades, and laſtly, in reſpect to *Monies*, the general Medium of Commerce, we are neceſſitated to underſtand them as originally deſigned for the Uſe and Service of Mankind.

X. **Phyto-Theology.** Under this Head we conſider the numerous Theological Principles that offer themſelves from the Subject of *Trees*, *Plants*, and *Vegetables*, the Kinds and Species of which are without Number; the whole Doctrine of Vegetation is fraught with Deſign, and is in itſelf a continued Demonſtration of infinite Wiſdom and Power; for, if we conſider the Make or Structure of a Plant, we ſhall find it a noble Inſtance of Organization, in which the inert and inanimate Parts of Matter are put in Motion, and made to act according to a certain ſtated Law of Nature, and to unfold to our Views, either annually, or in longer Periods of Time, numberleſs and beautiful Inſtances of divine Skill, Compoſure, and Mechaniſm, in the Forms of *Trees*, *Plants*, and *Flowers*.

As the Vegetation or Growth of a Plant is made to depend on certain nutricious Fluids, or Juices in the Earth; ſo the Means for acquiring them, we find in the Structure of every Part; for, if we examine it, it appears every where to conſiſt of two Syſtems of Veſſels in the Form of long and ſlender Pipes, one Set of which are of a larger Diameter, and deſtined for the Circulation of Air (for this Fluid, we have before obſerved, is alſo neceſſary to the Life of a Plant) the other Set of Veſſels have their Cavities, or Bores, wonderfully ſmall, on Purpoſe for attracting the vegetable Juices of the Earth, through which they are diſperſed in numberleſs fine Bundles, Branches, and capillary Filaments, which compoſe the Roots of each Plant; for it is well known by Experiment, that Fluids will always be attracted by capillary Tubes, and to Heights, greater in Proportion, as the Diameters of the Bores are leſs.

In the next Place, if we look into the Structure of theſe fine Veſſels, and their curious and different Diſpoſition, in the Bodies of different Plants, it will afford us Matter of Wonder and Amazement; and to obſerve the Manner in which they are ultimately divided, and ramified through all the Subſtance of the Leaf, is a ſhort but inſtructive Leſſon, on the Subject of divine Power and Wiſdom. Hence the wonderful Structure and Function of the Leaves appear; the Veſſels bring hither the Sap, Part of which is employed for the Nouriſhment of the Leaf, another Part here goes off by Perſpiration, and a third Part is returned for the Vegetation and enſuing Year's Growth of the Tree, whence appears the Neceſſity of that Duplicate, or double Syſtem of Veſſels, anſwering to Veins and Arteries, that we find in Leaves, when we anatomize them: There too we obſerve thoſe curious and fine wrought Pellicles, or Skins, with which the Leaves are covered, on each Side, and in which we obſerve the *Cellulæ*, in which the green Particles, which make the Subſtance of the Leaf, are depoſited; here alſo we obſerve thoſe numerous *Papillæ*, in which are the fine Spiracles, or Pores, through which the perſpirable Matter goes off, ſo ſmall are they, as to eſcape the Sight, even when magnified many thouſand Times in Diameter in the Solar Microſcope.

Again, if we obſerve the Structure of the Bark, we ſhall find it to conſiſt of two different Parts, the internal and external; the inner Part conſiſts of a great Number of fine lignous Fibres, diſpoſed in ſeveral cylindric Syſtems, one within the other, the Number of which originally is equal to the Number of Years deſigned for the Growth of the Tree; for every Year the refluent Sap, ſuppling one of thoſe Syſtems of Veſſels, cauſes them to grow larger, and become the Shell, or Caſe of Wood, by which the Bulk of the Tree is every Year increaſed, the outer Part of the Bark, ſerving only for a common Covering or Integument to the internal Part, or Rudiments of the Tree. Such is the Contrivance, and ſo great the Art employed in the Conſtruction of Vegetables!

The Parts of a Plant, every Way conſidered, appear wonderful to the curious Obſerver; the beautiful and rich Variety of *Flowers* in Plants does not more regale the Eye than it ſtrikes our Reaſon, when we reflect on the great Deſign in making the Leaves to conſiſt of ſuch different ſized Particles, as might render them capable of reflecting differently the Particles of Light for that Purpoſe; for, had the Particles of Matter been the ſame in all Leaves, there could have been no Colour at all; the Parts of the Flower, upon Examination, appear to be Arguments of an exquiſite Deſign, ſince we obſerve, the *Stamina* are neceſſary to ſupport the *Apices*, which contain that fine Duſt or *Farina* which impregnates and fecundates the Seed; in order to which, it falls upon the upper Part of the *Stylus*, or *Piſtil*, and from thence is communicated to the *Matrix*, or *Ovary*, in which the Seed is contained, whence it appears, that there is ſuch a Thing as we may properly call *Sex*, or Gender in Plants, the Male and Female Parts of which are found in the ſame Flowers in moſt Plants, but in different Flowers in ſome, as *Cucumbers*, *&c.*

The Fruit is that Part which ſucceeds the Flower, and contains the Seed and the moſt eſſential Part of the Plant, which is here nouriſhed, as it were, in its embryo State, 'till it arrives to Perfection, and gives Birth to the infant Plant, ſo far we may admire the myſterious Proceſs in the original Production of a vegetable Subſtance; and the more ſo, when we look into the moſt curious and exquiſite Apparatus of a Cuticle, Pulp, Juices, Branchery of Veſſels, the Stone, the Core, *&c.* appointed by Nature, for that Purpoſe, and is, at the ſame Time, deſigned to regale the Taſte of Mankind, as much as the Flowers were to delight the Eye, and to gratify the olfactory Nerves. It is needleſs to obſerve the beautiful Variety of the different Forms in which the Fruits of Plants appear, and yet is conſtantly the ſame in each particular Species.

The Seed is the ultimate Part of a Plant to be conſidered, conſiſting of the embryo Plant and two other Parts, or Lobes, encloſing it, in which State it is fitted to be put into the Earth, there to receive the vegetative Juices, by which it is nouriſhed, gradually unfolded, and at length, brought to Perfection in its adult State of a Plant or Tree. This is the viſible Proceſs of Nature in Vegetation; and here, with a little Reflection, we ſhall ſee, that not only infinite Wiſdom, Power and Deſign is in every Part diſplayed in a moſt amazing Degree, but particularly in this Subject, we meet with ſomething which quite confounds our reaſoning Faculties, and an Experiment which almoſt ſeems to prove Impoſſibilities poſſible; it will be ſufficient to ſay, at once, that every *Plantule*, ſmall as it is in the Seed, does yet contain Myriads of other Plants of the ſame Kind, with all their Parts really exiſting in infinite Miniature, and that for Inſtance, the firſt Acorn that ever was formed or planted, did really contain in itſelf the *Stamina*, or original Parts of all the Oaks that ever have been, or ever ſhall be produced, from the Beginning to the End of the World; the ſame is to be ſaid of the original Seed of every other Plant; a Matter ſo very myſterious and inconceivable, that we can but juſt aſcribe it to Omnipotence itſelf.

We have already obſerved what a wonderous Variety Nature has exhibited in the Faſhion, Form, and Modes of Plants, and their ſeveral Parts, their Stems, Branches, Leaves, Flowers, Fruits, Roots, *&c.* and how they are variegated with different Kinds of Colours; we may add to this, one ſingular Circumſtance, relating to the Poſture or Poſition of a Plant, which is always *Upright*; for in what Manner ſo ever it be placed in the Earth, when it begins to grow, it will always ſtrike its Root downwards, and riſe itſelf perpendicularly upwards; and to aſcribe ſuch a Diſpoſition in Vegetables to meer Chance would argue us void of any Reflection; ſince no other viſible Cauſe can be aſſigned for that, than its deing moſt commodious for Mankind.

When we conſider the vaſt Dimenſions of ſome Plants, and the extreme Miniature of others, the firm and ſtrong Texture of ſome, and the ſucculent and pulpy Subſtance of others, we ſee from thence, how wiſely they are contrived and adapted, to anſwer the neceſſary Purpoſes and Uſes of Man and Beaſt; they are deſigned for Food to all Beaſts of the Field, and the Leaves, Fruits, and Roots of many of them make the more exquiſite and reliſhing Part of Diet to Man. We need only add to this the Neceſſity of Timber-trees in Architecture, Civil, Military and Naval; for to what Purpoſe would it be, to have Seas to navigate, or Winds to move the Ships, if there was not Timber to build them? The ſame may be obſerved with reſpect to Fortifications, Houſes, and the vaſt Variety of Houſhold Furniture, and therefore upon the whole, it appears, that Vegetation is ſo far neceſſary, that it appears to be the very Foundation of Nature itſelf, and every Way deſigned to anſwer all its Neceſſities, Conveniencies, and Pleaſures very amply.

XI. Zöo-Theology; From the Conſideration of vegetable Nature, we aſcend a large Step higher to contemplate the Wonders of creating Power in *animated Matter*, where we ſhall find ſuch a Diſpoſition and Modification of Matter, as muſt appear in every Reſpect aſtoniſhing; for here we ſee Matter (in itſelf abſolutely deſtitute of any Power) endued with a threefold Power, *viz.* of *Vegetation*, of *Senſation*, and of *Cogitation*; by the Firſt, it is formed, moulded, and made to grow into the various Subſtances of Bodies of Animals, according to their innumerable different Kinds and Species; by the Second, it is rendered ſuſceptible of Impreſſions made upon it by external Objects in the different Ways or Modes of *ſeeing*, *hearing*, *ſmelling*, *taſting*, and *feeling* of them; by the Third, it is enabled to think, reflect, and reaſon upon every Thing that offers to this intellectual Faculty: An Animal therefore, in its higheſt Perfection, is the nobleſt Work of Nature, and which we ſhall now conſider more particularly, as poſſeſſed of thoſe Powers and Faculties that are abſolutely above the Efficiency of any ſecondary Cauſes, and therefore muſt be aſcribed to the firſt Cauſe only.

For firſt, Vegetation, or Growth in Animals, is an Effect as much ſuperior to that which we obſerved in Vegetables, as the Form it makes of an Animal is more exquiſite than that of a Plant. The Evolution of the ſeveral Parts of animal Bodies, from their firſt State of Exiſtence in infinite Miniature, in *Semine Maſculino*, to its full grown State of Maturity, is a Proceſs of infinite Power only, as the ſeveral Parts of which they conſiſt can be the Contrivance only of infinite Wiſdom and Intelligence.

As animal Life and Growth depend upon Aliments taken into the Body; ſo the provident Author of Nature has provided for each Species of Animals a wonderful Variety in this Reſpect; Fleſh, Graſs, Grain, and every Thing the Earth produces, is, one Way or other, made ſubſervient to the Life of Animals; the Aliment, or Food, thus taken in, requires a Comminution, Bruiſing, or Grinding down, for which Purpoſe Animals are provided with proper Organs for Maſtication, or Chewing their Food, where required, and wonderful is the Apparatus of Teeth, and other Parts of the Mouth for this Purpoſe; the Food, thus prepared, is tranſmitted, by animal Mechaniſm, to a proper Receptacle, we call the Stomach: Which is one, two, or more, according to the different Proceſs, which Nature has thought fit to take, in different Sorts of Animals, for reducing the groſſer Food to a fitter State for yielding its nutritive Parts by Concoction, in the Stomach; from thence, by inimitable and unaccountable Art, it is carried into another Organ, where the uſeful and alimentary Parts are ſeparated from the reſt, by a wonderful Diſpoſition of Veſſels, by which it is conveyed to the circulating Stream of Life, the *Blood*; by the Mechaniſm of the Heart, the firſt Spring of animal Life, the Blood receives its Motion, and is the appointed Medium for diſpenſing Nutrition to every Part of an animal Body; and in the Courſe of this purple Fluid, we find a great Number of other appropriated Organs for ſecerning, or ſeparating various other neceſſary Juices, according to the different Nature and Sex of the Animal, which, when a Man comes to conſider thoroughly in every Part, will appear ſuch an amazing, ſuch a perfectly well concerted, and divine Piece of Machinery, as is not only out of the Power of Man to effect, or even imitate; but what ſhould ſtill ſtrike our Reaſon much more, is every Way incomprehenſible, by all the Powers of the human Mind.

We farther obſerve, in the animal Fabric, a Part of a ſuperior Conſtruction, and deſtined to anſwer the nobler Purpoſes of Senſation; I mean, the *Syſtem* of NERVES, which have their Origin in the principal *Viſcus*, the Brain, from whence they are detached, by Pairs, to the proper Organs of Senſation: Thus a Pair is appropriated to the *Eyes*, and from thence convey to the Mind the various Impreſſions made on it by the Rays of Light, whence all our Ideas of Viſion ariſe: Another Pair goes to the Ears, where, curiouſly diſpoſed, they receive the Impreſſions of the impulſive and elaſtic Air under all its Modifications; whence all our *Senſations of Sound* ariſe to the Mind: Another Pair is ſent off to the *Noſtrils*, where being diſplayed in a moſt exquiſite Manner, they conſtitute the Senſe of *Smelling*; principally for Pleaſure in Man, but of abſolute Neceſſity in many other Animals: A fourth Pair of Nerves is appropriated to, and curiouſly wrought through the Subſtance of the *Tongue* and *Palate*, the immediate Organs of *Taſte*; and, laſtly, the remaining Part of the nervous Syſtem is ſo wonderouſly interwoven in the Subſtance of the Body, that not a ſingle Point, however ſmall, can any where be found, but what is defended and rendered exquiſitely apprehenſive by a Nerve; and hence the Senſe of *Feeling*.— On ſuch a ſingular Conſtruction of the animal Body depends all our Senſations of Pleaſure and Pain, and of courſe from thence muſt reſult the Happineſs and Miſery, which the mere animated Part of Nature is ſubject to; for this brings us, in the laſt Place, to conſider,

That the greateſt Effort of infinite Power and Wiſdom, which appears in Nature, is the implanting a Mind in Animals, which conſiſts in a Power of Cogitation, or Thinking, and that in various Degrees of Perfection. We are now touching upon the higheſt Excellence of animal Nature; but the Powers of the Mind, by which we are rendered cogitative and rational, in all the Degrees that we obſerve in the Scale of animal Beings, are Principles ſo wholly unknown to us, that the Mind of Man himſelf is totally incapable of conceiving any Ideas of them; and ſince we know that Matter in itſelf cannot think, we muſt confeſs, that it is a Power Divine imparted to it, from whence it derives all its intellectual Faculties.

Our Reflections hitherto have been on thoſe Subjects which are common to all Animals; but it will be, in the next Place, greatly worth our while, to take notice of the Peculiarities and ſpecific Qualities belonging to each reſpective Tribe, or Kind: And firſt, we remark in thoſe which we call *Brutes*, *Beaſts*, or *Quadrupedes*; in which we may take notice of many Things that plainly indicate perfect Counſel, and Deſign; amongſt which we may obſerve, their *prone Poſture*, which is neceſſary, in as much as they are all deſigned to gather their Fruit from the Earth, and for which the ſeveral Parts of their Bodies are admirably contrived and diſpoſed for that Purpoſe. In the next Place, their Manner of moving is on *all Four*; for as they are deſigned principally for the Uſe of Mankind, this Way of moving is more commodious than any other, as they can ſuſtain greater Burdens, and exert a greater Force, and move with greater Celerity; but in this Reſpect, we find a wonderful Variety from the ſwifteſt to the ſloweſt-moving Quadrupede. In the *third Place*, the Kinds and Species, and different Forms of the Bodies, in this Claſs of Animals, are innumerable, as their Bulks and Sizes infinitely various; but we always find, that thoſe of every particular Kind and Species have always the ſame Form, Size, and other Accidents of Body and Mind; thus ſome are made for Strength and Labour, as the Horſe, the Camel, *&c.* ſome for Purpoſes of Food and Cloathing, as the Cow, the Sheep, the Swine, *&c.* ſome for Sport and Pleaſure, as various Kinds of Dogs, particularly fitted by Nature for this Purpoſe, with proper Shape, Proportion and Diſpoſition of Parts, as in the Grey-hound for Courſing, the Hair for Flight, the Fox, the Stag, and many other Animals might be inſtanced, to the ſame Purpoſe. *Fourthly*, the Cloathing of Animals is a plain Proof of Deſign in a double Reſpect; for their thick Skins, covered with Hair, in ſome, and Wool in others, ſerves not only to keep them warm, in conſtant Expoſure to the Weather, but alſo it is evidently deſigned to anſwer the ſame Purpoſes for Man, ſince moſt of our own common Cloathing conſiſts of ſuch Materials manufactured; and the Furs of many Kinds of Animals make not only the richeſt, but the moſt comfortable Part of Attire to the better Sort of People, in every Nation, eſpecially in the colder Climates. In the *fifth and laſt Place*, the Armature of Animals, that is, the natural Weapons they employ in their own Defence, muſt command the Attention of every conſiderate Perſon; thus, the Horns in ſome, the Teeth and Tuſks of others, the Talons and Claws in Beaſts of Prey, the dexterous Uſe of the Heel in the Horſe-Kind for kicking, of the Fore-feet in the Mole, and other Animals, for making their Way under Ground; the Quills of the Porcupine, the intolerable Stench of the Fox, the Pole-Cat, *&c.* ſufficiently convince us of the many Ways and Methods which Nature has employed, and put in the Power of Animals, to uſe in their own Defence.

XII. Ornitho-Theology. The Contemplation of the Nature of Birds will furniſh as many irreſiſtible Arguments, to prove their Frame, Structure, Actions, and Manner of Living, the Reſult of the moſt conſummate Wiſdom, and Pre-determination, in their firſt Creation; for as this Family, or Tribe of Animals, was deſigned for the Inhabitants of the Air, ſo all their Parts are evidently contrived to anſwer that Purpoſe; with this View, the Heads of Birds have that peculiar Form that meets with leaſt Reſiſtance in paſſing through the Medium, and for dividing the Parts of the ſame, in their ſwift Motion through it. The Make of the Head is farther remarkable in the particular Form of the Beak, or Bill, which is of a very hard, ſtrong, bony Subſtance, and fitted, in Reſpect of Magnitude, Length, and Form, to anſwer the Ends of an Inſtrument for procuring their Food, according to all the different Ways of Living appointed for this Sort of Animal; alſo it is farther to be obſerved, that the Situation of the Eyes in the Head of a Bird is ſuch, as enables him to ſee all round him at once; and the Ears are diſpoſed in the moſt commodious Manner for Flight.

The Way, or Manner of moving, appointed for Birds, is *two-fold*, viz. *Flying* and *Walking*; to anſwer both which Purpoſes, the wiſe Author of Nature has made uſe of no more Limbs than before in Quadrupedes, but has here converted the two *Fore-Feet* in them into *Wings* for the feathered Tribe, and furniſhed the other two Legs with proper *Claws* and *Talons*, not only for *Walking*, but in a moſt wonderful Manner for ſeeking, catching, and ſecuring their Food, or Prey. The peculiar Structure of the *Larynx*, the *Stomach*, the *Lungs*, and other *Viſcera* in the Bodies of Birds, as well as the external Change of the Form, all unitedly declare the moſt conſummate Art and Deſign.

The *Plumage* of Birds is what moſt of all excites Admiration in every curious and attentive Obſerver. The *Hair* of Beaſts is changed into *Feathers* for Birds; and theſe of different Sorts and Kinds; ſome deſtined for the Uſe of Flying, as the large Pinions in the Wings and Tails, and others for Covering and Warmth, which are therefore of a fine and ſoft Texture, and of ſuch a peculiar Nature as to admit of no Water to adhere to them, by which Means they are kept conſtantly dry and warm, tho' always expoſed to the Weather; the Art they uſe in *dreſſing* and *pruning their Feathers* is wonderful, as well as the *Oil-Bag* and other Parts miniſtring thereto. Laſtly, if we look into the Structure and Make of the Feather, we ſhould find in that alone all the Proofs of Pre-contrivance, Wiſdom, and infinite Power, that any *ingenuous Atheiſt* could poſſibly require for his Conviction.

As to the *Flight* of Birds, all Parts are evidently conſtructed with that View; but the Mechaniſm of the Wing and Tail is beyond all Diſpute the pure Effect of Art; for ſince the *Air* is the Medium, which, by its *Re-action*, muſt give the Bird Power to fly, and ſince it is ſo very rare that a large Part of it muſt be put into Motion at once to afford a ſufficient Force, therefore we ſee the Wing is ſo formed, that when there is Occaſion to fly, it is expanded into a large Surface, and by that Means, can act upon a large Quantity of Air at once; and thereby the Bird derives an eaſy Faculty of Flying; and is balanced, as it were, in its Flight by the neceſſary Expanſion of its Tail.

The *Nidification* of Birds, or the Art of making their Neſts; and the wonderful Inſtinct, Thought, and Sagacity, which they are all obſerved to employ on that Occaſion, have always been the Subject of Surprize to Mankind; to obſerve the inimitable Dexterity of thoſe little Architects, and the different Method taught to each particular Species, of conſtructing the Neſt, and that every Individual ſtrictly keeps to the proper Plan, muſt afford us too illuſtrious a Scene of natural Science, to render it poſſible for us to be ſo inadvertent, or ſtupid, as to imagine that all this ſhould proceed from blind Caſualty, or Neceſſity. For where is the Neceſſity that one Bird ſhould build one Way, and another Bird another Way? Why one ſhould chuſe Sticks for one Part; Moſs for another; Feathers for another; and Mud, or Earth, for another? Why ſome ſmall Birds make large Neſts, and ſome large Birds, ſmall ones? Why ſome will be at no Pains to build a Neſt, and others employ ever ſo much? Nay, ſo very artful and careful are ſome Birds about their Neſts, that they actually *ſew three Leaves together, with a Cotton Thread, and proper Stitches*; in which Cavity they form their Neſts, and then ſuſpend them by a long Thread from the Twigs of the Tree, that they may be out of the Reach of devouring Vermin. What wonderful Wiſdom and Foreſight is here!

The *Incubation* of Birds, or the Laying of Eggs, and ſitting on them a requiſite Time to hatch them, ſhews us the wonderful Œconomy of Nature in this Species of Animals for bringing fourth their Young; the Female lays her Eggs in the Neſt that has been made; the Egg has a Bubble of Air in the great End; the *Punctum Saliens*, or Treddle, or the *Stamina* of the *Embryo* Fowl, is poſited near that Air; by the Warmth of the ſitting Fowl, the Air is rarified, its Spring encreaſed, and thereby made to produce a conſtant Action on the Treddle, and other Parts of the Egg; by which Means the vital Motions are begun, and continued, till the fœtal Fowl is perfected, and fit for Excluſion. But tho' this be the intended Proceſs of Nature, yet how is the Parent-Bird apprized of all this before-hand? When the Egg is laid, what neceſſary Connection is there between the Bird and the Egg then? Will the *Atheiſt* ſay, ſhe goes by Chance to the Neſt, and ſits brooding on the Eggs the proper Time, and no longer? That when the Hen retreats for Food, the Cock caſually goes to the Neſt to keep the Eggs warm till her Return? This would be looked on, by all reaſonable Men, as a ridiculous Inſult on common Senſe, and a Piece of Effrontery exceeding Stupidity itſelf.

The *Migration* of Birds is another Effect of a wonderful Inſtinct in ſome Families of the feathered Tribe. *The Stork in the Heaven knoweth her appointed Times, and the Turtle, and the Crane, and the Swallow obſerve the Times of their Coming.* Jer. viii. 7. But can we *think*, or *ſay*, they *go*, and *come*, at *proper and ſtated Times* by mere *Chance?* That only a few Species of all the Kind, exchange their Climes by *Neceſſity?* That ſome ſhould go one Way, and ſome another, by Dint of *Fate?* That the ſame Species ſhould conſtantly go, from Year to Year, the ſame Way, and to the ſame Place, by Accident? Such Philoſophy as this would be vain indeed: We muſt therefore neceſſarily underſtand, that all theſe Things proceed from the wiſe Ordination and Appointment of the Divine Author of Nature, who having endued Animals with the Power of Thinking, has ſo modified that Power, and directed it, in every particular Species, in ſuch a Manner as he thought fit; and often-times leaves us intirely unacquainted with the Reaſon of his Operations.

XIII. ICHTHYO-THEOLOGY preſents us with a copious Syſtem of Principles, derived from the Nature of *Fiſhes*, towards the general and manifold Demonſtration of a Deity; for here we proceed, as in every other Part, to obſerve, that this particular and extraordinary Species of Animals are every Way formed and fitted for the Manner of Life allotted them, and to the Element in which they are to live and move.

The *Medium* deſtined for their Habitation is *Water*, denſer than *Air* many hundred Times; the Motion by *Walking* is therefore here not practicable; the *Fiſhes* have accordingly *no Legs*; in ſo denſe a *Medium* there can be no ſuch Thing as *Flying*, and hence we find no *Wings* (of the common Sort) provided for theſe Creatures. The Mode of Motion, in this Element, muſt be *Swimming*; to which End the Bodies of *Fiſhes* are rendered as *buoyant* as poſſible, the *Form* of the Head and Body ſuch as will ſuffer the leaſt Obſtruction from a *Medium* of ſo great *Reſiſtance*: And laſtly, becauſe ſo great a *Re-action* is derived from Water, therefore the *mechanical Inſtrument* of Motion, neceſſary to act on this Fluid, need not be very large, eaſily moveable, and ſuch a Number, and ſo diſpoſed, as may keep the Body in *Equilibrio* continually; and ſuch an *Apparatus* we find in the *Fins* and *Tails* of Fiſhes.

As theſe Animals are to move in a very reſiſting *Medium*, a Motion of the Head (as in *Quadrupedes* and *Birds*) would not be ſo eaſily performed, and therefore it is not ſet on to the Body by a *Neck*; yet, that nothing may be deficient on that Account, the *Eyes* of a Fiſh are ſo placed on the Sides of the Head, that nothing can eſcape their Sight; for by this Means they can ſee every Way about them; they ſeem to be deficient in one of our Senſes, *viz. Hearing*; for we find no Organ for that Purpoſe in a Fiſh; but then they have no Occaſions for it; for Sounds have little or no Place in their unelaſtic Element, and all the Intelligence they want from the World above, is fully ſupplied by their very acute Sight.

As the *Medium of Reſpiration* to them is different from that of other Animals, ſo inſtead of Lungs, they have a peculiar Organ for that Purpoſe we call *Gills*, by which the Water is, as it were, reſpired, and ſo much Air contained in it, as is neceſſary to the Life of Fiſhes; if we contemplate the Nature and Make of their *Fins*, they appear wonderfully adapted for producing *Agility*, *Freedom*, and *Celerity of Motion*; by their ſtrongly ribbed and bony Structure, and continued membranous Surface, they act with great Force on the Water, and from thence receive a very great Power of Motion; to which the peculiar *Form* and *Poſition* of the *Tail* contribute not a little.

The *Buoyancy* of Fiſhes is a moſt neceſſary Condition for their Way of Life, and for this Purpoſe they are admirably accommodated with an *Air-bladder*, by which they can make themſelves *lighter* or *heavier* at Pleaſure; for by filling or emptying the ſame, the Body of the Fiſh will be a little encreaſed or diminiſhed in Bulk, and thereby its ſpecific Gravity conſtantly altering, whence the Fiſh is rendered more or leſs buoyant, as Occaſion requires. Add to this, that the Figure of the Body is ſuch, that the *Center of Gravity* will always render an *Equipoiſe* extremely facile, being adjuſted in this Caſe by the ſtricteſt Rules of *Mechanics*.

As to the Covering of the Bodies of Fiſhes, as they are not expoſed to Wind and Weather, the Cloathing of other Animals is not here neceſſary; inſtead of which they are accoutred, as it were, with *Coat-Armour*, or plaited all over with *Scales*; a ſingular Contrivance to defend them againſt Danger, and the Caſualties they are expoſed to from what ever they might ſtrike againſt in their ſwift and ſudden Motion thro' their watry Way. The large Sort have thicker, harder, and ſtronger Scales; and the Fiſhes of the firſt Magnitude have very thick and almoſt impenetrable Skins, covered with a thick and ſtrong Sort of Hair; and it would be endleſs here to recount all the different Ways which the infinite Wiſdom of their Maker has taken for their Well-Being and Preſervation in this Reſpect.

The *Armature* of the ſcaly Tribe exceeds that of every other Species of Animals; witneſs the prodigious *Sword*, *Saw*, and *Horn*, in ſeveral Sorts of Fiſhes; the Spines and *Stings* of others; the benumbing Quality of the *Torpedo*; the winged Fins of the *Flying-Fiſh*; the *Atramentum* of the Scuttle-Fiſh; and a thouſand other Weapons, and Ways of Defence, we find kind Providence has imparted to this otherwiſe helpleſs and ſhiftleſs

Tribe of Animals, who have no Voice to ſpeak, nor Means to retreat and ſhelter themſelves from their inimicable and voracious Purſuers.

As to *Shell-Fiſh*, as they are a diſtinct Genius of the watry Inhabitants, we ſhall ſay nothing; becauſe it is impoſſible to ſay enough of any one particular Species, in order to obſerve all the Marks and Signatures of wonderful Art and Contrivance every Way employed for the Production and Continuance of ſo ſtrange and extraordinary a Sort of Exiſtence in its amazing and endleſs Variety of Forms.

XIV. INSECTO-THEOLOGY. Under this Head we contemplate the Nature of *Inſects*, which are of numerous Kinds, and almoſt innumerable Species contained under each; every one of which, if but ſlightly conſidered, would prove the Subject of a *prolix and pathetic Lecture in Theology*. This Sort of Creatures, tho' uſually looked upon with Contempt, are perhaps the moſt amazing Part of the Creation. For with Regard to their various Manner and States of Life; the Make and Shape of their Bodies; the Number, Minuteneſs, and Finery of their Parts; their wondrous Senſations, Inſtincts, and Sagacity; and laſtly, their ſingular Agility and Swiftneſs of Motion; I ſay, in all theſe, and many other Reſpects, they are not to be parallelled by any other Order of Beings of the Animal-kind. How iniquitouſly do we judge of our Creator's Handy-Works? We ſcarcely think his larger Eſſays, and bulky Parts of natural Mechaniſm worth obſerving; and wholly paſs by, as vile and abject, the glorious Specimens of his moſt exquiſite Art, and the higheſt Performances (in Miniature) of omnipotent Power. How perverſe and prepoſterous ſhould we deem that Perſon, that ſhould take more Notice of a *Clock*, than of a *Watch* that is worn in a *Ring* on the Finger?

The various States or Stages of Life, by the manifold *Metamorphoſes* or *Transformations* which they undergo, is what, in the firſt Place, commands our Attention, and excites our utmoſt Admiration. This Animal muſt firſt exiſt an *Embryo* in the Egg; he is then, 2dly, excluded in the Form of an *Eruca*, Maggot, Caterpillar, or Worm; after ſome Time ſpent in this Form, he becomes transformed, 3dly, into an *Aurelia*, or *Cryſalis*, where he remains ſome Time motionleſs, and in a State of Inaction;

action; this torpid State is formed, perfected, and at laſt excluded; 4thly, the beauteous Fly, full grown, richly attired, and bedecked with all Finery and Pride of Nature. Some have a 5th State, as we have lately inſtanced in the moſt wonderful Species of all this Tribe, the *Ephemeron Fly.*

The firſt State is that of the *Embryo*, or Rudiments of the *Inſect* in the Egg; and in order to its Perfection for the 2d State, with how much Care and Order are thoſe Eggs depoſited? Sometimes on the Leaves, or in the Wood and Fruit of Trees and Plants; ſometimes in the Bodies of other Animals; at other Times on the Walls and Sides of Rooms; oftentimes in the Earth; but principally in and on the Surface of Water, where we obſerve the beautiful Order in which they are arranged and conglutinated together, with many other Inſtances of Care and Circumſpection in the provident Parent Inſect. For which Purpoſe we muſt further obſerve the wondrous Inſtinct and Dexterity of theſe in reſpect of their *Nidification*, or Manner of making their *Neſts*; nay, here we find the *ſtricteſt Geometry* employed in this Affair, Witneſs the Combs of the divinely inſtructed Bee; in the Cells of which the Eggs are depoſited, and the delicious Proviſion ſtored up for the future Family; but could Chance, to which all Things are indifferent, direct this Animal to pitch upon that very Figure or Form for its Cells, which of all others will contain the *greateſt Quantity of Honey* with the leaſt Labour and Expence of Materials; and at the ſame Time, one of thoſe three Figures only, as will admit the Cells and their Baſes to be placed by each other without leaving any Vacuity or Space between? No one, ſurely, can be ſo beſotted as to think any ſuch Thing poſſible, by any other Cauſe than that *divine Wiſdom* which has but very lately imparted this moſt curious Part of geometric Science to Man himſelf.

The *ſecond State* of Inſects is that of the *Eruca*, or what appears in the Form of a *Maggot*, *Worm*, or *Caterpiller*; theſe excluded from the Egg, are obſerved to be well furniſhed with a ſufficient Apparatus of Feet, Parts about the Mouth, &c. as enables them to ſhift for their Food, without any *parental Care*, which is neceſſary to the Young of all other Species of Animals hitherto conſidered. But it is very remarkable, they are hatched in that very Place or Medium, or on that very Plant, which Nature has made their Food, or where they find it in Plenty about them, and ſo are in no Danger of periſhing or even ſuffering for Want. What wonderful, what a diverſified Proviſion is here for that Sort of Creature we ſo often deſpiſe, but can never enough admire! For if with Microſcopic Eyes we ſurvey the Forms of *Erucæ* in general, we ſhall find they are moſt curiouſly and wonderfully made with ſuch exquiſite Parts as Ignorance never dreams of; and adorned with richer Colours than vulgar Eyes can any where behold. One Thing more ought to be conſidered, *viz.* to whom does the *Beau Monde* owe all their pomp and grandeur of Dreſs? Their rich and gorgeous Apparel? Their *Silks*, *Sattens*, *Damaſks*, *&c.* by which they make ſuch a ſhining Figure in Life? Is it not all to this contemptible Creature, the *Caterpiller?* Is it not their very *Intrails* too, and given them at *ſecond Hand* only, when caſt off by the *Eruca?* Is it not on theſe poor Creatures, (that with ſo much Pleaſure we are always ſo ready to cruſh under our Feet,) that the richeſt Manufacture of the World depends? Such Reflections ought to humble our Pride, and teach us to have more Regard to the Animals now in Queſtion, if not as the *Handy-work* of God, yet as our Friends and Benefactors.

The *third State* of *Inſects* is that which is called the *Cryſalis* or *Aurelia*, a Sort of hardiſh Caſe in which the *Eruca* has at length contracted itſelf, and as it were laid itſelf up for a *future Change*; this is a kind of dormant inactive State, and quite Motionleſs. This *Aurelia*, or Shell-State, is what the *Eruca* ſeems to be apprized of, for he very deliberately ſpins himſelf a *ſilken Ladder* to climb up the Sides of Houſes and Rooms by, and after that, is ſome Time in chuſing a proper Place for his Repoſe, and *ſemi-vital State.* Others are obſerved with great Aſſiduity to weave themſelves a delicate *ſilken Shroud*, in which they depoſite themſelves for their next Transformation. Again; many of them, long before-hand, make, with inimitable Art, their curious *Thecæ*, Caſes, or Coffins, in which at the appointed Time they reſign themſelves to Fate. Now can any Perſon reflect on ſuch a wonderful Procedure as this, aſcribe it all to Chance or Neceſſity; and then pretend to be rational? No, he would be too ridiculous to be laughed at.

The *fourth or laſt State* of this Tribe, is the *Inſect-Fly* in Perfection. And here Nature diſplays her various Scenes of Glory, Beauty, and inimitable Art; the Mechaniſm, Out-lines, and Miniature-paintings of Inſects, are all aſtoniſhing Inſtances of infinite Power and Skill. The wonderous Form and exquiſite Colours peculiar to, and always found in each particular Species of Inſects, convince us of the moſt perfect Deſign and Intention of the Author of Nature. How glorious a Creature would the *Butterfly* appear in its rich Attire and Colouring, could it be viewed totally with a Microſcopic Eye? And how variable the charming Tints of all the Species of the *Papilionaceous Kind?* The ſame may be obſerved of all the *Phalænæ* or *Moth*-tribe. The Colouring of ſome of the *Ichneumon* or common Fly Species, and alſo of many *Scarabs* which come from the warmer Climes, exceed for Intenſity and Glory any Thing but the Colours of Light itſelf. The *Elytra*, or Tortoiſe-ſhell Wings of ſome ſmall *Scarab* Flies, when repreſented at large in the *ſolar Microſcope*, appear emboſſed, and ſet, as it were, with *Diamonds*; and is readily acknowledged, by all who ſee them, to be the richeſt and nobleſt Piece of Nature's Workmanſhip that ever their Eyes beheld.

How wonderful are the large, hemiſpherical, fixed and latticed Eyes of all the Fly-Species? The Head of a Fleſh-Fly, in the Microſcope, is a ſtriking Inſtance of the greateſt Beauty, Order, and Art; and what ſhall we think of that admirable Apparatus we call the *Antennæ* or *Feelers*, with which the Heads of ſome Sorts of *Gnats* are furniſhed, and the pompous bruſhy Foretops of others? If any Man can view theſe, and ſupinely aſcribe them to Fate or Contingency, it will appear, that Nature has been much more ſolicitous about the *Furniture of* the *Head of an Inſect*, than ſhe has about *that of his own.*

When we reflect on the fine, ſtrong, light, membranous *Wings* in general, we cannot enough admire their Mechaniſm and wonderful Texture; and how nicely they are folded up and placed in Order under the *Elytra*, or ſtrong Caſes, which we ſee on the Backs of all the Scarab or Beetle Kind; how vaſtly ſtrong and interwoven, as it were, with bony Ribs and Lattice-Work are the Wings of the *Locuſt Tribe*, for ſuſtaining a long and tedious Flight? How curious are the Wings of all the *Phalænæ*-

Kind, covered with peculiar Art, with a beautiful Sort of ſilky Scales, while thoſe of the *Ichneumon* Sort are all over beſet and fimbriated all around with ſtrong, ſhort and briſtly Hairs? But Nature now and then deviates from ſtated Order (which Neceſſity can never do) and forms the Wings of ſome Moths with *Feathers altogether*. Yea, farther, we obſerve with Aſtoniſhment, that ſome Animals of the Inſect Claſs have a Power of Flying (if I may ſo call it,) without any Wings at all, as in many Sorts of Spiders, which is an Effect beyond the Power of the Science of Motion to account for, and muſt therefore be allowed to the Effect of a divine Energy or Mechaniſm not yet diſcovered to Man. The incredible Agility and Swiftneſs of Motion in the *Wings*, *Legs* and other Parts of theſe Animals, ſhew us in how great a Perfection the Power of *muſcular Motion* is here diſplayed; another Thing oftentimes eſſayed by inquiſitive Man, but ſtill denied to his Reſearches. The Form and Shape of the Bodies of theſe Creatures are very wonderful; the *Head*, the *Thorax*, and the *Abdomen* connected in moſt Flies in a ſurpriſing Manner, by Parts ſo fine, that they ſcarcely ſeem to belong to, or depend on each other; nor indeed is it here ſo great as in other Animals; for if you ſever the Head of an Inſect, the remaining Part will perform its uſual Actions and Functions of Life for a conſiderable Time, *viz.* 15 or 20 Days, but does not ſtir out of its Place, as it is then unable to find its Way about.

In the next Place, how wonderfully has Nature cloathed theſe Animals with *Coats of Mail* for their Safe-guard and Defence, in curious *Annuli*, or Rings, admitting a free and eaſy Motion of the Parts required to be moved? How nicely are their Bodies poiſed in Flight by Means of thoſe little *Pointels*, or Balls on a Foot-ſtalk, under the Wings, which they move as Rope-dancers do their Poles, to ballance themſelves in Motion.

When we look into the Inſide of theſe Animals, we meet with ſuch kind of *Vicera* or Parts, as not being found in other Animals, we know not what to call them; for, as *Pliny* long ſince obſerved, Inſects ſeem not to have *Nerves*, or *Bones*, or *Cartilages*, or *Fleſh*, or *Shell*, or *Skin*, but ſomewhat of a *middle Nature* between them all; ſuch a Structure and Diſpoſition of Parts, as ſurpaſſes all mortal Underſtanding and Conception, can be allowed the Effect of infinite Wiſdom only. And if we conſider the Structure of any one Part only, it will ſhew us enough of Deſign; thus, for Inſtance, the Leg of a Fly appears to be conſtructed to anſwer the moſt evident Purpoſes; the *ſtrong* and *briſtly Hairs* are the *Bruſhes* conſtantly employed to keep the Head and Body clean; the large and ſtrong Joints in the Thigh-Parts, are appointed for Strength and Support; the *numerous Articulations* towards the End of the Leg, or Foot, is an admirable Artifice, by which the Foot can be bent and accommodated to the Figure of every Surface on which it treads; the two large and ſharp-pointed Claws ſtrike into the Pores of every Body it lights upon; and the two Pads, or ſpongy Balls on the Extremity of the Foot, between the Claws, are ſuppoſed to afford a viſcous Matter, by which the Animal can ſecurely walk on the ſmootheſt Subſtance in Nature, and in any Poſition of its Body. Can we conſider and view all theſe Things, and not perceive the Contrivance and Forecaſt in the wonderful Author of all? This would argue (in the Mind) a *Gutta Serena* indeed!

Farther, if we conſider the Manner and Means by which they live, and gather their Food, we ſhall find the conducting Hand of Deity every where; it is that which directs the *painted Fly* to the Flower, to ſuck from thence the ambroſial Food by Means of its wondrous *Proboſcis*; the *Bee* is hereby directed to collect, from the ſame flowry Scenes, her Stock of *Wax and Honey*, and to ſtore it up with inimitable Art and Œconomy in the Granaries of the Hive. The ſame preſiding Wiſdom has furniſhed with *Induſtry* and *Sagacity* the indefatigable *Ant*; the *Spider*, too, from thence derives its curious *textrine Art*. And no Doubt, we may conclude, that even the *Louſe* and the *Flea* are thereby taught to ſeek their Subſiſtence in the Fleſh and Blood of larger Animals.

To conclude, the *Armature* of Inſects, and their natural Means of Defence, ſhew plainly enough how much they are the Care of their divine Author; how curious is the Structure of the Stings of Inſects? And how terrible in general to their Enemies, particularly Man? What Wounds and Pangs does the *Hornet* inflict? And how precipitately do we fly, if perſued by that dreadful Inſect? What wonderous Legs is the *Flea* provided with, to eſcape the Finger of its Blood-thirſty Purſuer? And who has Courage enough to try the Force and Power of the *antlated Horns* of that large *Scarab*, we call the *Buck-fly*? The Rage of theſe

Creatures often ſtrikes us with Terror, prone as we are to deſpiſe them; upon the Whole, we may conclude that an Inſect is a noble Work of God, and deſerves our Admiration inſtead of Contempt. It ſhould humble our preſumptive Pride, when we conſider that our *Wiſdom and great Underſtanding* meet with a Check, and a *Ne plus ultra* in every ſcurvy Inſect!

XV. Herpeto-Theology. Our Survey of the Theological Principles, which the Field of Nature ſo amply affords, has brought us at length to thoſe which ariſe from the Contemplation of Reptiles and Serpents, and *creeping Things* of every Kind. Theſe, inſtead of being the Subject (not of *Contempt* only, as Inſects are, but) of our utmoſt *Abhorrence* and *Deteſtation*, ſhould, on the contrary, become the Subject of our more accurate Attention and Examination, and fill our Minds with ſerious Wonder and Amazement. Theſe, low as they are in the Scale of Life, have yet a Voice to praiſe their Maker, (*Pſalm* cviii. *Ver.* 10.) and that in very exalted Strains.

For whether we conſider the Form of theſe Creatures, or their Motion, or the Structure and Parts of their Bodies, their Way and Manner of Life, their Means of Preſervation and Defence, and many other Particulars; we ſhall find them all ſo many genuine Oracles, and moſt perſuaſive Arguments of boundleſs and ineffable Wiſdom, Power, and Art.

The *Forms* of this Tribe of Animals are ſo numerous, that we cannot recount them; but if we conſider that of the *Serpent*, or *Snake*, or that of *Snails*, or of *Worms*, or of *Eels*, or of the various Kinds of *Millepedes* and *Centipees*, and infinite others; we ſhall obſerve that all ſuch as the Way of Life deſtined for each Species require, we have no Diſtinction of *Head*, *Thorax*, and *Abdomen*, as in moſt other Animals, in the outward Form; but generally they conſiſt of one long continued Body from Head to Tail. We muſt neceſſarily in all this acknowledge the moſt evident Marks of Deſign.

As the *Motion* of theſe Creatures is by Means of *Legs* or *Feet*, in ſome; and altogether without in others; and what may be thought extremely odd, is, that where we obſerve the greateſt Number of Feet, the Motion is always ſloweſt; and thoſe Animals which have no Feet are yet capable of a very quick Motion.

Whence we learn how many different Ways Nature often takes to accompliſh the ſame End; and that the ſame Means are often employed to anſwer very different Purpoſes, which plainly demonſtrates Will, Choice, and Deſign in the Efficient, and that therefore it cannot be *Fate*.

It is not only a Matter of the higheſt Curioſity, to obſerve in the *Centipee* Kind, what a Number of Feet are in Motion at once, yet ſucceſſively and in the utmoſt Order; but it is an Inſtance of the moſt exquiſite mechanic Skill; and if we admire the Wiſdom in contriving the Muſcles and Articulations to produce Loco-Motion in a few Legs, and large ones in common Animals, what muſt we think of it here, where ſuch Numbers are moved with ſo much Regularity, and in ſuch wondrous Miniature? The Nerves, the Veſſels, the Muſcles, the Ligaments, the Connection of Parts, in ſhort, the Whole is but one entire Scene of ſtupendous Machinery indeed!

Nor is the *ſinuous Motion* of all the *Serpent* Kind leſs wonderful; how curiouſly are ſuch Bodies conſtructed, that without the common and viſible Means of Motion, can yet move themſelves forwards with ſuch a ſtrong, inſinuating, and impulſive Force, not only on level Ground, but over every Surface? Can climb up Trees, and raiſe their long extended Bodies quite upright, and move them every Way? Again, when we conſider the *Vermicular Motion* of *Worms*, or even the Motion of that dull Animal the *Snail*, we ſhall find enough to exerciſe our boaſted Reaſon and inventive Faculties to account for it. And indeed, after all, it will be well if in theſe Reſearches our Wiſdom does not meet with an unlucky Rebuff, and we forced at laſt to confeſs that the *Serpent*, the *Worm*, and the *Snail* are Inſtances of ſuch divine and unſual Geometry and Mechaniſm, as far ſurpaſs all *human Comprehenſion*.

Then as to the Manner of getting their Food, nothing can be more viſible than the fore-appointing Hand of Providence in this Reſpect. As ſome of theſe Creatures move ſo ſlow, they would be in Danger of being *ſtarved*, if they had far to go in Search of Food; but as the Caſe now ſtands, indulgent Nature has put it as it were in their Mouths, and they find it in every Clod, and on every Plant they crawl over. Thoſe of ſwifter Motion, live on Prey, which they acquire partly by Agility, and partly by natural Cunning; yea, we have not only read, but heard it affirmed by Eye Witneſſes, that ſome of the Viper and Snake Kind have a Sort of *natural Magic*, and can even *charm* their Prey, by putting themſelves into a proper Attitude, and fixing their glaring Eyes on thoſe of the devoted *Bird*, *Mouſe*, *Squirrel*, &c. by which Means the poor Creature is put into a ſtrange Agitation, and in a dolorous Plight finds itſelf at length ſo far bewitched as to leap into the Devourer's Mouth. Could *Lucretius* himſelf reflect on ſuch a *Phænomenon*, and be ridiculous enough to aſcribe it to *Fate?* Will any *Sceptic* be bold enough to aſſert, that *Chance* could give to one Animal the Faculty of *charming another out of its Life?* This would be an Inſtance of doleful Depravity indeed.

Once more, let us conſider another wonderful Specimen of providential Contrivance; the moſt predacious Animals are generally prevented by one Mean or other, from having it always in their Power to ſeize on every Thing they ſee or find; the huge *Crocodile* and *Alligator* are long in turning their unweildy Bodies about in purſuit of their Prey; and what ſtill is more remarkable, the moſt tremendous Serpent is made to carry a *Rattle* in his Tail, no doubt, on Purpoſe to give previous Notice of his direful Approach, and that every heedleſs Animal might not fall an inevitable Victim to his all-devouring Jaws.

Hence then it ſhould appear, that a *Reptile*, or a *Serpent*, is not that horrid and deteſtable Creature as we are uſually apt to imagine; but, on the contrary, are moſt extraordinary Inſtances of the Creator's Power, Wiſdom, and Providence, and as ſuch they ought to be regarded by every reaſonable Man.

XVI. ANTHROPO-THEOLOGY. Under this Head we might expatiate largely on the Principles and Proofs of a Deity, ariſing from the Nature and Form of MAN; but ſince we have already taken a general Survey of *Animal Nature* under all its remarkable Varieties and Gradations, in other Species of living Creatures, it would be needleſs here to repeat them in conſidering the Parts and Stucture of his Body; it remains only to obſerve, with Reſpect to the Animal Fabric, that every Part is formed and finiſhed in the higheſt and moſt exquiſite Manner, and excellently accommodated to anſwer all the Purpoſes of his ſuperior Station, and Manner of Life; that they are all adapted to expreſs the Paſſions, and other animal Actions, in a much more perfect and noble Degree than in other Creatures; and that the ſame Parts, which in them miniſter only to the Neceſſities of Life, are made in Man the Organs and Sources of the moſt exquiſite Pleaſures and Senſations of animal Life. Theſe Things, therefore, ſhew the high Regard and diſtinguiſhing Care which the great Author of Nature has had for Man in particular, above all the Reſt of the Creation.

Then as to the *Form of Man's Body*, it is another ſingular Proof of his Maker's Regard for his Honour and Dignity; he walks *erect*, with a graceful and majeſtic Air and Mein, his Attitude and Action ſuit his exalted Nature; his Voice is articulate and harmonious, and he is every way qualified for ſocial Life. In ſhort, there is no Doubt but Man is the *nobleſt Inſtance of animal Mechaniſm* that the Nature of Things will admit of.

But abſtracted from his *animal Nature*, let us place him in the moſt advantageous and exalted Point of View, *viz.* that of a *rational and intelligent Being*, endowed with Faculties and Powers of MIND, and then we muſt conſider him as little leſs than a *Divine Exiſtence*, in Part at leaſt; for ſince thoſe Powers and Faculties are not found in Matter, they muſt be derived from the *Divine Source, the Deity*; and therefore *Moſes*, not leſs elegantly than juſtly, expreſſes himſelf on this Occaſion,—— *God created Man in his* OWN IMAGE.—— Thus the *Pſalmiſt* in the ſublimeſt Strains deſcants on this Matter, *Thou madeſt him a little lower (or, inferior) to the* ANGELS; *Thou crownedſt him with* GLORY *and* HONOUR. He can not only *think*, but *reaſon* on his Thoughts; he can arrange them in Order, and make proper Deductions from them; he not only *perceives*, but *reflects*, and *recollects* the paſt, and oftentimes fore-ſees future Events; by theſe noble Faculties the paſt and future Time is, as it were, preſent to his Mind; he purſues a mental Tour, not only thro' the various *Kingdoms* of the *Earth*, but from *Planet* to *Planet*, from *Sun* to *Sun*; from one *Syſtem of Worlds* to another thro' all the boundleſs Space. He is hereby made to know the Difference of *natural and moral Good and Evil*; he is hereby rendered a Free-Agent and conſequently capable of *Virtue* and *Vice*; he is hereby fitted for SOCIETY, and rendered ſuſceptible of all *ſocial*

Ties, *Relations* and *Duties* thence ariſing. He is hereby enabled to contemplate the Works of Nature, and thereby of being convinced of the *Reality*, yea, the *Neceſſity of the Exiſtence of that Divine Being we call a* God, from the numberleſs Inſtances of infinite Power, Wiſdom, Goodneſs, and a general Providence. For the inviſible Things of him (*i. e.* the *Attributes and Perfections of God*) from the Creation of the World are clearly ſeen, being underſtood by the *Things that are made*, even his *eternal Power and Godhead.* Hence he obſerves a Relation between himſelf as a *Creature*, and *God* as his *Maker*; and thence a new Source of Duties devolves upon him; the Duties of *Religion* and *Piety*, to be diſcharged in various Acts of *Reverence*, *Devotion*, and *Adoration.*

The *Nature*, *and Frame of Man*, therefore, plainly demonſtrate the *Exiſtence of a God*; ſince it is impoſſible for him to find any other Cauſe of thoſe wonderful Properties and Powers that he finds himſelf poſſeſſed with; and to whom he can aſcribe thoſe involuntary Actions, Movements, and Senſations both of *Body* and *Mind*, which he knows are continually animating and actuating the whole Machine.

We ſhall here finiſh our Survey with *one Topic more of Theologic Principles*, and that is, The *viſible Tranſitions* which Nature makes from one Part of her Works to another, the *evident Connections* of the various *Species one with another*, and the *Concatenation* of the Whole together. It would be eaſy to point out the various *Genera* of *Earths* and *Stones*, allied to each other by ſomething of a *middle Nature*; that *Marcaſites* and *Metals* are connected by different *Foſſils*; that there is a remarkable Union of *Stones* and *Plants* in all the *Lithophytes*, and *Lithodendron Tribes*, ſo plentifully found in the Sea; that *Plants* and *Animals* are moſt amazingly connected in all the *Polypus Kinds*, both on Land and Sea; and it is very remarkable, that the *Sea Polypuſſes* have *Shells*, but thoſe in freſh Water none.

Not only the *Genera*, or Kinds, but the very Species of *Plants* and *Animals* are alſo connected, eſpecially the latter. Thus the *Birds* and *Fiſhes* are allied in the *Flying Fiſh*; the *Bird* and *Quadrupede*, in the *Bat*; the *Bird* and the *Inſect* in the *Plumed*, or *feathered Moth*. The *Inſect* and the *Quadrupede* in the *Gryllatalpa*, or *Mole-Cricket*; the *Quadrupede* and the *Fiſh*, in the *Sea-*

Lion, the *Whale*, &c. And laſtly, muſt I dare to mention any Connection between the *Brutal* and the *Human Species* in that opprobrious Animal, the *Ourang Outang*, or *Chimpanzee?* It has no *Tail*, it walks *erect*, and its *Skeleton* is not eaſily diſcerned from that of a *Child*. I ſhall ſay no more on this Head, but leave the Reader to make what Inferences he thinks proper from the Premiſſes.

Upon the Whole, then, I preſume it is ſufficiently ſhewn, that THEOLOGY is a moſt *perfect Science*; depending on the plaineſt, moſt obvious, and demonſtrative *Principles*; that its *Object*, viz. *the Exiſtence of a* GOD, is the moſt *evident, rational, and indiſputable Truth* in Nature; and laſtly, that the *End* of this Science is to teach Mankind the *Devoirs*, *Homage*, and *Worſhip* due to the *Supreme* LORD *and* GOVERNOR *of the Univerſe*.

OF
ETHICS.

ETHICS, or Moral Philoſophy, has been eſteemed the nobleſt of all the Sciences; for as every Thing is more or leſs valuable in Proportion as it is uſeful to Society, and contributes to the Happineſs of Mankind, ſo this, which teaches and explains the Means of attaining human Felicity, or the greateſt Happineſs our Natures are capable of in this Life, is the moſt uſeful, the moſt excellent, and the moſt valuable of all others, and the Standard by which the real Dignity and Importance of every other Science is to be aſcertained. *Ethics* has therefore been diſtinguiſhed by the moſt pompous Titles, and ſtiled, the *Guide to Virtue and Happineſs*, the *Inventreſs of Laws*, and the *Directreſs of Life*.

Ethics is called Moral Philoſophy, becauſe it conſiſts in the Study of human Nature, its moral Powers, and various Connections, and from theſe deduces the Laws of Action: It is called Morality, from its being the Science of Manners or Duty, which it traces from the Nature and Condition of Man, guiding him in the Practice of Virtue, and teaching him to ſhun the deceitful and deſtructive Paths of Vice.

As the Object of this Science is Happineſs to ourſelves and to Society, we ſhall firſt mention in what the Happineſs of a reaſonable Being muſt neceſſarily conſiſt; that by having a clear and diſtinct View of the End, the Paths that lead to it may be the more certainly pointed out.

And here it muſt be obſerved, that the Happineſs of Man, as a Being endued with rational Powers and bodily Senſes, muſt be agreeable to his whole Nature; but eſpecially to his diſtinguiſhed and more exalted Faculties; it muſt be ſuited to every Situation in which he can be placed, and to every Character he may ſuſtain; it muſt be ſuch as may be enjoy'd without Shame or Anxiety, without Suſcipion of wrong Conduct, or Fear of future ill Conſequences; ſuch as will ſupport a calm and ſteady ſerenity, and effectually deliver him from turbulent and diſquieting Paſſions; ſtand the Teſt of deliberate Reflection, improve upon longer Experience, and laſt as long as he himſelf exiſts. This is the Happineſs that ſprings from Virtue; a Happineſs that is ſeated in the Mind, and which can only proceed from an inward Conſciouſneſs of acting from the invariable Rules of Reaſon, Virtue and Humanity.

As *Ethics* conſiſts in the Study of human Nature, the moral Powers, Appetites and Paſſions of Man, and the Duties which reſult from theſe and his various Relations, we ſhall firſt take a View of Man in the ſeveral Stages of Life, and ſhew from whence his Connections and moral Obligations ariſe, trace the Paſſions from their Sources, and ſhew their Uſe in the moral Syſtem: we ſhall then treat of Reaſon, human Agency, and the Freedom of the Will; of Law and Conſcience, as the Rules of human Action; and laſtly of Virtue and Vice, with the Duties a Man owes to God, to Society, and to himſelf.

We would here obſerve, once for all, that in treating of theſe Duties we ſhall not enquire into the excellent Precepts and Doctrines of Chriſtianity, which will be conſidered ſeparately by themſelves; and therefore no Set of Chriſtians whatever can juſtly take Exception at the Truths we ſhall here advance. We are now treating of the Religion of Nature, as diſtinguiſhed from all external Revelation; and ſhall not enquire, what Man might have been, but how he is conſtituted; not what he may by Education, Habit, or foreign Influence, come to be, or do; but what he is formed to be, and to do by Nature, and his original conſtituent Principles.

To begin with Man and his Connections, as they ariſe in the ſeveral Stages of Life. The new-born Babe is extremely weak and helpleſs, he has neither Food, Cloaths, or any Thing by which he can either ſupport, or defend himſelf; he however finds an immediate and ſure Relief in the *Tenderneſs* and *Care* of his Parents, who by the ſtrongeſt Inſtincts are linked to the Child, before he has the leaſt Idea of their Affection: The Infant makes known his Wants in a Language ſo ſtrongly expreſſive that it immediately reaches their Hearts, and ſerves from Time to Time to procure him ſpeedy Relief. His Senſes, from the very Inſtant in which he enters into the World, preſent him with a ſucceſſive

Train of new Objects, and fill him with growing *Wonder* and *Admiration*; but without reſting on any of them, pleaſed with what is moſt new, he paſſes from Object to Object, and thus the Paſſion of *Wonder* is kept awake, and the *Love* of *Novelty* formed. At length, Objects becoming more familiar, he has Leiſure to examine and fix his Attention on thoſe that appear the ofteneſt before him, and he becomes acquainted with his Parents, and thoſe of the Family who are moſt converſant with him; he contracts a Fondneſs for them, is uneaſy at their Abſence, and rejoices at ſeeing them again. Theſe Feelings become on his Side the Foundation of a moral Attachment to his Parents, his Brethren, his Siſters, and other Perſons in the Family: he becomes intereſted in their Concerns, and feels *Hope* or *Fear*, *Joy* or *Grief* on their Account as well as his own. His *Self-love* and *Fondneſs* for thoſe about him, make him jealous of a ſuperior Affection ſhewn to another Infant, and he pines away with Diſcontent; but if his Friends more equally divide the Marks of their Affection, or treat the other Infant with Coolneſs, his Jealouſy will be removed, and he himſelf will careſs the Infant who was before the Object of his Diſpleaſure. His *Affection*, and the *Joy* and *Grief* he feels on their Account, are, as an ingenious Author obſerves, the firſt Links of the moral Chain, the early Rudiments, or Out-lines of his Character, and his firſt rude Eſſays towards Agency, Freedom and Manhood.

In his Childhood he extends his Acquaintance abroad, and unites himſelf to a Set of Companions and Play-fellows; he intereſts himſelf in their Pleaſures or Griefs, and his Humanity expanding his Heart, in Proportion as his mental Powers encreaſe, he is deeply affected with the Sight of Miſery even in a Perſon with whom he has no Connection; a Wound given to a Stranger, the Sight of the ſtreaming Blood, and the Groans of Anguiſh, fill him with *Terror* and awaken his *Pity*. But though at this Age his Appetites and Paſſions have the Aſcendant, his Imagination and intellectual Powers open a-pace, and he forms a Variety of Taſtes; reliſhes ſome Things and diſlikes others, as his Parents, Companions, and a Variety of other Circumſtances lead him to combine agreeable or diſagreeable Sets of Ideas, or repreſent to him Objects in pleaſing or odious Colours. His active and ſocial Powers expand themſelves in Proportion as his Views are enlarged; he obtains a *Love of Action*, is filled with *Emulation*, and is fond of *Praiſe*; he has *Curioſity*, *Docility*, and a Paſſion for *Command*. He compares one Thing with another, and judges of Characters. He ſoon becomes ſenſible of the Conſequence of his own Actions, triumphs in thoſe that attract Applauſe, and bluſhes at, and ſeeks to hide thoſe that bring Contempt. "By Means of theſe Powers (ſays the Rev. Mr. *Fordyce*, from whom we have borrowed many of the above Obſervations*) he becomes a fit Subject for Culture, the moral Tie "is drawn cloſer, he feels that he is accountable for his Conduct "to others as well as to himſelf, and thus is gradually ripening "for Society and Action."

As the Child advances to Manhood, his *Reaſon* and *Judgment* obtain Strength as well as his *Paſſions*. He ſees the Beauty and intrinſic Excellence of a virtuous Conduct, and however prevented by ill Company, or head-ſtrong Paſſions, never fails to obſerve that *Juſtice* and *Humanity* are in their own Nature infinitely more amiable than *Injuſtice* and *Cruelty*; that *Fidelity* is more excellent than *Treachery*, and *Fortitude* than *Puſilanimity*. In this Seaſon of Life new Senſes of Pleaſure invite him to new Purſuits; he has an Appetite that points his Views to the other Sex, by whom alone it can be gratified; but in order that this Appetite may not be indulged in a manner deſtructive of all Order, and even of that Society which it was deſigned to perpetuate, he becomes ſenſible of the Attractions of Beauty, and the internal Graces of the Mind, which leading him to confine his Views to a particular Object, he becomes ſuſceptible of a new Paſſion, a tender Kind of Friendſhip, which gives a ſofter Turn to his other Affections, and at length becomes the Cement of a new moral Relation, and the Source of ſome of the ſtrongeſt Inſtincts in Nature, by which, as by ſome powerful Chain, the Parent is linked to the Child, and another moral Connection begun, in order to prompt him to rear up his Infant-offspring. "Meanwhile, it is impoſſible (ſays the Rev. Mr. *Fordyce*) for him to "have lived thus long, without having perceived ſome of the "more auguſt Signatures of Order, Wiſdom and Goodneſs "ſtamped on the viſible Creation, and of thoſe ſtrong Suggeſtions within himſelf of a Parent-mind, the Source of all Intelligence and Beauty. Hence ariſe thoſe Sentiments of *Reverence*, and thoſe Affections of *Gratitude*, *Reſignation* and *Love*, which link the Soul with the Author of Nature, and form the moſt ſublime and God-like of all Connections.”

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* See *Fordyce*'s Moral Philoſophy.

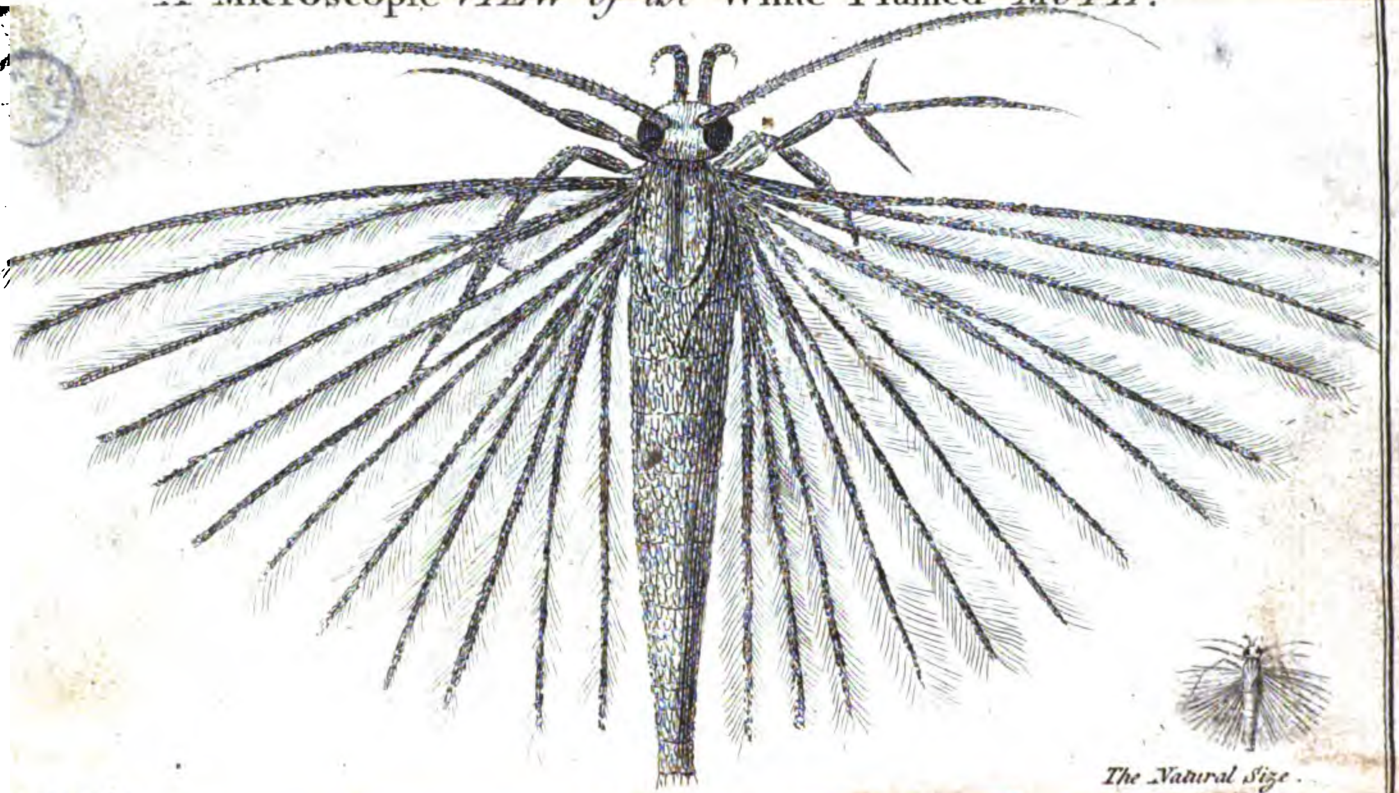
Man being now arrived at his Prime, takes in a larger Proſpect of human Life; his reaſoning Faculties arrive at their utmoſt Perfection, and he becomes more ſenſible of his Connection with the Public, and that particular Community to which he more immediately belongs: he forms *Friendſhip*, graſps at *Power*, courts *Honour*, lays down Plans of Intereſt, and becomes more attentive to the Concerns of Society. His reigning Paſſions prompt him, while he is in full Vigour, to provide for the Infirmities of Age; and his *Compaſſion* and *Gratitude*, heightened by his own *paternal Affection* which gives the Idea of that felt for him, prompts him to requite the Care and Tenderneſs of his Parents, by alleviating their Infirmities and ſupplying their Wants.

At length old Age approaches, attended with the *Love of Offſpring* and *Eaſe*, with *Tenderneſs*, *Anxiety*, and *Foreſight*. But the tumultuous Paſſions which in younger Years frequently hurry away the unguarded Youth, and prevent his liſtening to the calm Dictates of Reaſon, now ſubſide: and as human Life verges downwards, the Experience of the Aged is formed to direct, and their Coolneſs to temper the Heat of Youth. Thus every Age has its peculiar Genius and Set of Paſſions; and thus the Wants of one Age are ſupplied by the Capacities of another.

There are alſo Paſſions and Affections that are not peculiar to any one Period, but belong to every Age, and have more or leſs an Influence in every Breaſt throughout every Stage of Life. As *Self-love*, *Love of Life*, *Benevolence*, *Honour*, *Shame*, *Hope*, *Fear*, *Deſire*, *Averſion*, *Joy*, *Sorrow*, *Anger*, *Jealouſy*, and the like; among which *Joy* and *Sorrow*, *Hope* and *Fear*, ſeem to be only different Ways of exerting the ſame original Affections of *Love* and *Hatred*, *Deſire* and *Averſion*, ariſing from the different Circumſtances or Situation of the Object deſired or abhorred.

Theſe are the ſimple but powerful Springs by which Man is prompted to a conſtant Round of Action in order to ſupply his many returning Wants, and to guard againſt the various Evils and Dangers to which he is expoſed. By theſe Men are linked

Microscopic *VIEW* of the White Plumed *MOTH*.



The Natural Size.

M. delin.

Miſcellaneous Correſpondence, in Proſe and Verſe.

For *JANUARY*, 1755.

To the Publiſher of the GENERAL MAGAZINE, *&c.*

SIR,

IT is with pleaſure I obſerve, that one part of your deſign, is to oblige mankind with a new ſyſtem of mathematical learning, and as I think it cannot be too much recommended and encouraged, it will, in my opinion, be highly acceptable to the public, if you give them an account of its exceeding uſefulneſs from an ingenious eſſay upon that ſubject, by an anonymous author of the laſt century, but now out of print; which for a maſterly ſtile, ſpirit, perſpicuity, and ſtrength of reaſoning, ſurpaſſes any thing I have ever yet met with on that ſubject. I am Yours, &c.

A. B.

An ESSAY on the *Uſefulneſs* of MATHEMATICAL LEARNING, &c.

SIR,

I AM glad to hear from you, that the ſtudy of the *mathematics* is promoted and encouraged among the *youth* of your *univerſity*. The great influence, which theſe *ſciences* have on philoſophy and all uſeful learning, as well as the concerns of the public, may ſufficiently recommend them to your choice and conſideration: and the particular advantages which you of that place enjoy, give us juſt reaſon to expect from you a ſuitable improvement in them. I have here ſent you ſome ſhort reflections upon the *uſefulneſs* of *mathematical learning*, which may ſerve as an argument to incite you to a cloſer and more vigorous purſuit of it.

In all ages and countries, where learning hath prevailed, the *mathematical ſciences* have been looked upon as the moſt conſiderable branch of it. The very name Μάθησις implies no leſs; by which they were called either for their excellency, or becauſe of all the *ſciences* they were firſt taught, or becauſe they were judg'd to comprehend πάντα τὰ Μαθήματα. And amongſt thoſe, that are commonly reckoned to be the ſeven liberal arts, four are mathematical, to wit, *Arithmetic*, *Muſic*, *Geometry*, and *Aſtronomy*.

But notwithſtanding their excellency and reputation, they have not been taught nor ſtudied ſo univerſally as ſome of the reſt; which I take to have proceeded from the following cauſes: The *averſion of the greateſt part of mankind to ſerious attention and cloſe arguing*; their *not comprehending ſufficiently the neceſſity or great uſefulneſs of theſe in other parts of learning*; an *opinion that this ſtudy requires a particular genius and turn of head, which few are ſo happy as to be born with*; and *the want of public encouragement, and able maſters*. For theſe, and perhaps ſome other reaſons, this ſtudy hath been generally neglected, and regarded only by ſome few perſons whoſe happy genius and curioſity have prompted them to it, or who have been forced upon it by its immediate ſubſerviency to ſome particular art or office.

Therefore I think I cannot do better ſervice to learning, youth, and the nation in general, than by ſhewing, *That the mathematics of all parts of humane knowledge, for the improvement of the mind, for their ſubſerviency to other arts, and their uſefulneſs to the commonwealth, deſerve moſt to be encouraged.* I know a diſcourſe of this nature will be offenſive to ſome, who, while they are ignorant of mathematics, yet think themſelves maſters of all valuable learning: but their diſpleaſure muſt not deter me from delivering an uſeful truth.

The advantages which accrue to the mind by *mathematical* ſtudies conſiſt chiefly in theſe things: *1ſt.* In accuſtoming it to *attention*. *2dly.* In giving it a habit of *cloſe* and *demonſtrative reaſoning*. *3dly.* In freeing it from *prejudice, credulity*, and *ſuperſtition*.

Firſt, the mathematics make the mind attentive to the objects, which it conſiders. This they do by entertaining it with a great variety of truths, which are delightful and evident, but not obvious. Truth is the ſame thing to the underſtanding, as muſic to the ear, and beauty to the eye. The purſuit of it does really as much gratify a natural faculty implanted in us by our wiſe creator, as the pleaſing of our ſenſes: only in the former caſe, as the object and faculty are more ſpiritual, the delight is the more pure, free from the regret, turpitude, laſſitude, and intemperance, that commonly attend ſenſual pleaſures. The moſt part of other *ſciences* conſiſting only of probable reaſonings, the mind has not where to fix; and wanting ſufficient principles to purſue its ſearches upon, gives them over as impoſſible. Again, as in *mathematical inveſtigations* truth may be found, ſo it is not always *obvious:* this ſpurs the mind, and makes it diligent and attentive. *In Geometria* (ſays Quinctilian, lib. I. cap. 10.) *partem fatentur eſſe utilem teneris ætatibus: agitari namque animos, atque acui ingenia, & celeritatem percipiendi venire inde concedunt.* And *Plato* (in *Repub. lib.* VII.) obſerves, that the youth, who are furniſhed with *mathematical* knowledge, are prompt and quick at all other *ſciences*, ἐις πάντα τὴ Μαθήματα ὀξεῖς φαίνονται. Therefore he calls it κατὰ παιδεῖαν ὁδόν. And indeed youth is generally ſo much more delighted with *mathematical* ſtudies, than with the unpleaſant taſks that are ſometimes impoſed upon them, that I have known ſome reclaimed by them from idleneſs and neglect of learning, and acquire in time a habit of thinking, diligence, and attention; qualities, which we ought to ſtudy by all means to beget in their deſultory and roving minds.

(To be continued)

To the Publiſher of the General Magazine, *&c.*

SIR,

Though the following theorems were inveſtigated (as you are already acquainted with) on a particular occaſion, yet they may, perhaps, as the inveſtigation is new, and conciſe, be acceptable to your mathematical readers; and therefore, if you think proper, may be inſerted in the fifth half-ſheet of your Magazine.

I am Sir, Yours, &c.

Biddeford,
Jan. 3,
1755.

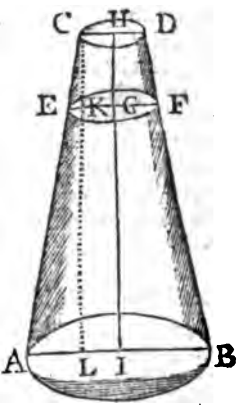
B. Donn.

A

A Theorem in Menſuration.

LET $t =$ the top or leaſt diameter, $b =$ the bottom or greateſt diameter, $d = b - t$, and $b =$ the height of a conic fruſtrum; then it's content is $= \frac{tb + \frac{1}{3}dd}{1.273236} \times b$.

Demonſtration. Let ACDB repreſent the conic fruſtrum; put $m = .7854$, $x =$ HG the diſtance of any ſection (parallel to the baſe) from CD; the reſt as above. By ſimilar △s as CL : AL :: CK : KE; ∵ CL : 2 AL :: CK : 2 KE, that is, $b : d :: x : \frac{dx}{b} = 2$ KE, ∵ $(t + \frac{dx}{b} =) \frac{tb + dx}{b} =$ EF; whence the area of the circle EF $= \frac{mt^2b^2 + 2mtbdx + md^2x^2}{b^2}$, and multiplying by $\dot{x}$, we have $\frac{mt^2b^2\dot{x} + 2mtbdx\dot{x} + md^2x^2\dot{x}}{b^2}$ = the fluxion of the ſolid; the fluent of which is $mt^2x + \frac{mtdxx}{b} + \frac{mddx^3}{3b^2}$, which when x becomes $= b$, is, by ſubſtituting b for x, $= \overline{t^2 + td + \frac{1}{3}dd} \times mb$; in which, if we write $b - t$ for its value d in the ſecond term, the theorem will be, $\overline{tb + \frac{1}{3}dd} \times mb$; but if we chooſe a diviſor, it will be, $\frac{tb + \frac{1}{3}dd}{1.27326} \times b =$ the content of the conic fruſtrum.



Q. E. D.

Corollary 1. The theorem $\overline{tb + {}_3dd} \times mb$, when $m = 1$, that is, when the fruſtrum is that of a ſquare pyramid is, $\overline{tb + \frac{1}{3}dd} \times b$.

Coroll. 2. When $d = b$, that is, when $t = 0$; $\overline{tb + \frac{1}{3}dd} \times mb$, becomes $\frac{bbmb}{3} =$ the content of a cone.

Coroll. 3. When $m = 1$, $\frac{bbmb}{3}$ is $= \frac{bbb}{3} =$ the content of a ſquare pyramid.

Coroll. 4. When the ſolid is a cylinder, then $t = b$, and $d = 0$, and ∴ $\overline{tb + \frac{1}{3}dd} \times mb$, is $= b^2mb =$ the content of a cylinder.

Coroll. 5. When the ſolid is a ſquare priſm, then, $m = 1$, and ∴ $b^2mb = b^2b =$ the content of a ſquare priſm.

Scholium. Whence it appears that we have after a compendious manner deduced from fluxions, theorems, for meaſuring cones and ſquare pyramids, and their fruſtrums, alſo for cylinders and ſquare priſms; and hence may be ſeen how exactly theſe theorems, deduced from fluxions agree with thoſe inveſtigated by other principles.

I am, Sir, Your Humble Servant,

B. DONN.

Mathematical Queſtions, to be anſwered.

Queſt. 1. *By Arithmeticus.*

REquired, a general method for multiplying and dividing decimal fractions, and preſerving exactly the decimal parts in the product or quotient, without the method of circulating numbers.

Queſt. 2. *By Perpendicularius.*

IF a point be taken any where within an equilateral triangle, and perpendiculars be let fall from thence to the three ſides of the triangle, the ſum of theſe three perpendiculars will be equal to the perpendicular of the whole triangle. Quære the demonſtration.

Queſt. 3. *By Triangularius.*

GIven, the two ſides of a plane triangle, and the included angle, *viz.* $AB = 20$, $BC = 25$, and angle $B = 110^\circ$. To find either of the other parts of the triangle by ſides and ſines only, without uſing tangents or ſecants, by a general theorem?

Queſt. 4. *By Aſtronomicus.*

IN Lat. 5°. N°. the 1ſt June 1755, what will be the ſun's amplitude, and his greateſt azimuth from the north?

An Elogy on Sir Iſaac Newton, *tranſlated from the Latin of Dr.* Halley.

BEhold the regions of the heav'ns ſurvey'd,
And this fair Syſtem in the balance weigh'd!
Behold the law, which (when in ruin hurl'd
God out of Chaos call'd the beauteous world)
Th' almighty fix'd, when all things good he ſaw!
Behold the chaſte, inviolable law!
Before us now new ſcenes unfolded lie,
And heav'n appears expanded to the eye;
Th' illumin'd mind now ſees diſtinctly clear
What pow'r impels each planetary ſphere.
Thron'd in the center glows the king of day,
And rules all nature with unbounded ſway;
Thro' the vaſt void his ſubject planets run,
Whirl'd in their orbits by the regal ſun.
What courſe the dire tremendous comets ſteer
We know, nor wonder at their prone career;
Why ſilver Phœbe, meek-ey'd queen of night,
Now ſlackens, now precipitates her flight;
Why, ſcan'd by no aſtronomers of yore,
She yielded not to calculation's pow'r;
Why the Node's motions retrograde we call,
And why the Apſides progreſſional.
Hence too we learn, with what proportion'd force
The moon impels, erroneous in her courſe,
The refluent main: as waves on waves ſucceed,
On the bleak beach they toſs the ſea-green weed,
Now bare the dangers of th' engulfing ſand,
Now ſwelling high roll foaming on the ſtrand.
What puzzling ſchool-men ſought ſo long in vain,
See cloud-diſpelling Matheſis explain!
O highly bleſt, to whom kind fate has given
Minds to expatiate in the fields of heaven,
All doubts are clear'd, all errors done away,
And truth breaks on them in a blaze of day.
Awake, ye ſons of men, ariſe! exclude
Far from your breaſts all low ſolicitude;
Learn hence the mind's ætherial pow'rs to trace,
Exalted high above the brutal race.
Ev'n thoſe fam'd chiefs who human life refin'd
By wholeſome laws, the fathers of mankind;
Or they who firſt ſocieties immur'd
In cities, and from violence ſecur'd;
They who with Ceres' gifts the nations bleſt,
Or from the grape delicious nectar preſt;
They who firſt taught th' hieroglyphic ſtile
On ſmooth * papyrus, native plant of Nile,
(For literary elements renown'd)
And made the eye an arbiter of ſound;
All theſe, tho' men of deathleſs fame, we find
Have leſs advanc'd the good of human-kind:
Their ſchemes were founded on a narrower plan,
Replete with few emoluments to man.
But now, admitted gueſts in heav'n, we rove
Free and familiar in the realms above;
The wonders hidden deep in earth below,
And nature's laws, before conceal'd, we know.

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* An Egyptian plant, growing in the marſhy places near the banks of the Nile, on the leaves of which the antients uſed to write.

Lend me your aid, ye bright ſuperior pow'rs,
That live emboſom'd in Elyſian bow'rs,
Lend your ſweet voice to warble Newton's praiſe,
Who ſearcht out truth thro' all her myſtic maze,
Newton, by every fav'ring muſe inſpir'd,
With all Apollo's radiations fir'd;
Newton, that reach'd th' inſuperable line,
The nice barrier 'twixt human and divine.

EUGENIO.

To Mr. Handel. *On the Loſs of Sight.*

HOmer and *Milton* might complain
They roll'd their ſightleſs orbs in vain;
Yet both have wing'd a daring flight,
Illumin'd by celeſtial light.
Then let not old * *Timotheus* yield,
Or, drooping, quit th' advent'rous field;
But let his art and vet'ran fire
Call forth the magic of his lyre:
Or make the pealing organ ſpeak
In ſounds that might the dead awake:
Or gently touch the ſprings of woe,
Teach ſighs to heave, or tears to flow:
Then with a more exalted rage
Give raptures to the ſacred page,
Our glowing hearts to heaven raiſe
In choral ſongs and hymns of praiſe.

* A muſician, in the time of *Philip* of *Macedon*, baniſh'd by the *Spartans* for adding a tenth ſtring to the lyre.

On CLARISSA. *By a Lady.*

I.

WOu'd'ſt thou, *mighty God* of *love!*
Wiſh the *worthieſt ſoul* to move,
Shew me what I now ſhall aſk!
Arduous too, will be the taſk!

II.

Shew me *beauty*'s *finiſh'd fair!*
Sweet in *temper*, *ſoft* in *air!*
Strongly fixt, on *virtue's ſide:*
Free from *envy*, void of *pride*.

III.

Bleſs'd with *this* tranſcendent *mind*,
More to *heav'n*, than *earth* inclin'd!
Happy, only to *beſtow:*
Wretched, at *another's woe*.

IV.

Scorning *riches*, that wou'd bring,
Truth, or *conſcience*, any *ſting:*
Wiſe, yet *humble*, *juſtly great!*
Patient, and reſign'd to *fate*.

V.

(Tho' accompliſh'd to out-ſhine
Every thought, beneath *divine!*)
Wander virtue's kingdom round,
All I aſk, will ne'er be found.

VI.

Cupid's pow'r can only ſhew
Excellencies here *below:*
Woud'ſt thou all theſe charms obtain,
Make *Clariſſa live again!*

A Receipt for a POET. *By the ſame.*

FIRST, ſuppoſing that *nature* has furniſh'd a *brain*,
(Elſe, all other *ingredients* are certainly *vain*)
Look out for a *countenance meagre* and *thin:*
Ne'er regard the *outſide*, ſo we furniſh the *in*.
And becauſe it is needful he ſhould not *live high*,
Let his *diet* be ſuch, as his *wit* will ſupply.
For oft by experience this knowledge we gain,
What *fattens* the *body* will make a *lean brain*.
But I'll venture to promiſe, with *that prudent care*,
'Tis a *thouſand to one* he has *nothing to ſpare*.
Let his *fancy* be *lively*, his *memory ſtrong:*
His *judgment* ſufficient to know *right* from *wrong*,
Attended by *prudence*, to bridle his *quill:*
Or elſe it wou'd probably lead him to *ill*.
Now ſhou'd he too *ſtrictly* adhere to the *truth*,
His *lays* muſt ſubmit to be reckon'd *uncouth:*
But waving this ſubject, that meets with *ſmall praiſe*,
Let him *ſee*, and *ſeem blind*, in theſe *politic days*.
For ſhould he *breathe free* the *ſatyrical vein*,
Each *wound* that he *gives* will redound to *his pain*.
No matter how *juſt* all his *cenſure may ſeem;*
'Tis a *road*, that will hardly arrive at *eſteem:*
Like *treaſon*, tho' never ſo highly *approv'd*,
The *traitor*, you know, is but ſeldom *belov'd*.
But where there is *merit!* in *foe*, or in *friend*,
Let him *ſcorn* to be *ſilent*, and boldly *commend!*

Advice to CUPID. A SONG. *By the ſame.*

I.

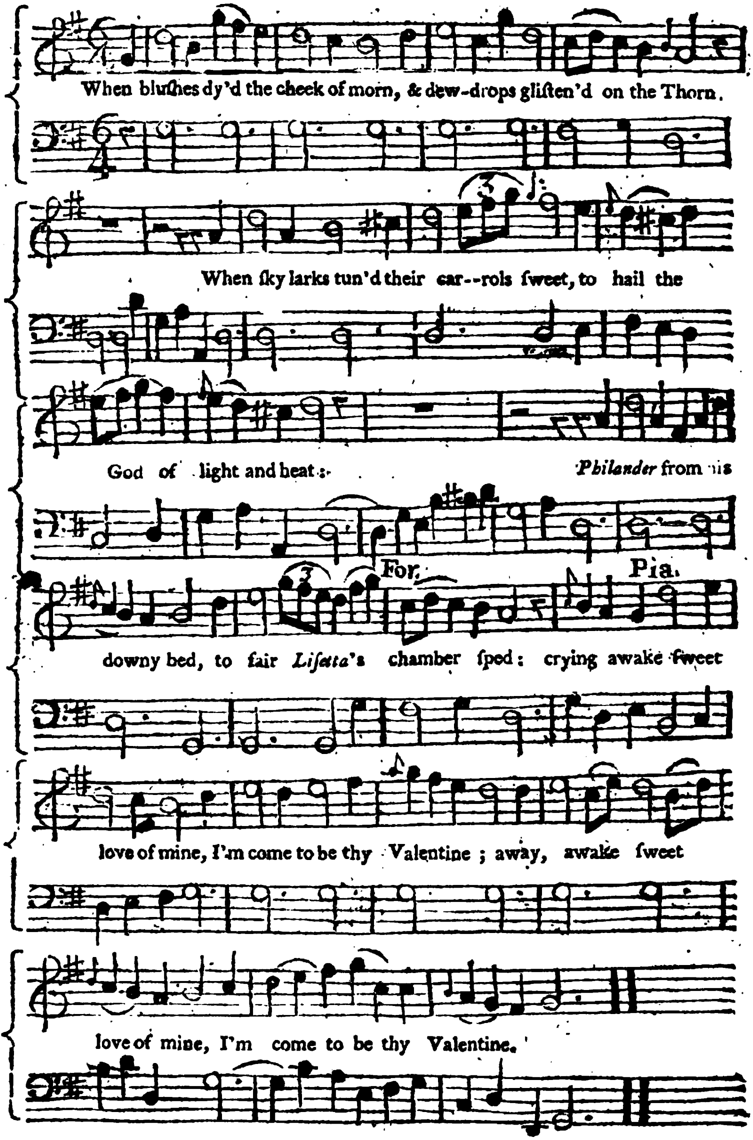
CUpid, ſince thou can'ſt not *ſee*,
Prithee now, be *led* by *me;*
To *Minerva*, ſtrait repair,
And implore her *guardian care:*
Woud'ſt thou make thy *pow'r compleat*,
Lay thy *arrows* at *her feet*.

II.

Throw each *fooliſh ſhaft* away,
Or they'll ever *go aſtray:*
Beg her, to *new dreſs* thy *ſtore*,
And with *wiſdom* caſe 'em o'er:
Tipt with *reaſon*, then they'll fly,
Nor can ever go *awry*.

V A-

VALENTINE's DAY. A *New Song.*


When bluſhes dy'd the cheek of morn, & dew-drops gliſten'd on the Thorn.
When ſky larks tun'd their car--rols ſweet, to hail the
God of light and heat:
Philander from his
For.
Pia.
downy bed, to fair *Liſetta*'s chamber ſped: crying awake ſweet
love of mine, I'm come to be thy Valentine; away, awake ſweet
love of mine, I'm come to be thy Valentine.

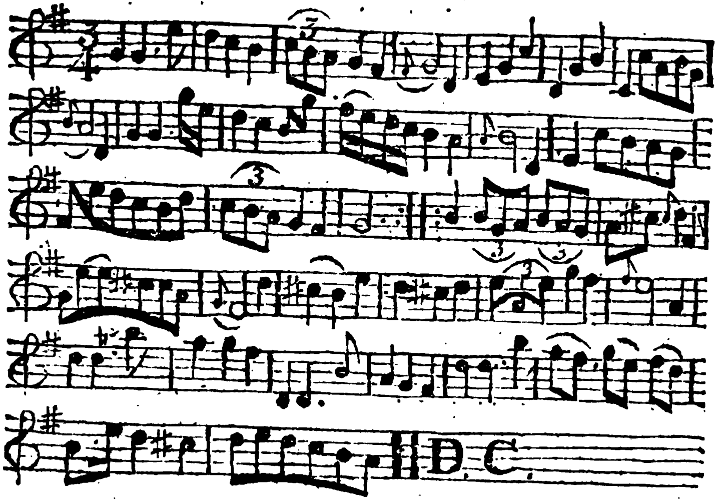
Soft love, that balmy ſleep denies,
Had long unveil'd her brilliant eyes,
Which, that a kiſs ſhe might obtain,
She artfully had clos'd again:

He ſunk, thus caught in beauty's trap,
Like *Phœbus* into *Thetis'* lap,
And near forgot that his deſign
Was but to be her Valentine.

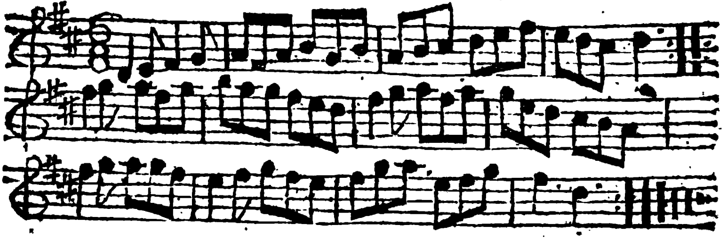
She ſtarting, cry'd, I am undone!
Philander, charming youth! begone,
For this time, to your vows ſincere,
Make virtue, not your love, appear:
No ſleep has clos'd theſe watchful eyes;
Forgive the ſimple fond diſguiſe:
To generous thoughts your heart incline,
And be my faithful Valentine.

The brutal paſſion ſudden fled,
Fair honour govern'd in its ſtead,
And both agreed, e'er ſetting ſun,
To join two virtuous hearts in one:
Their beauteous offſpring ſoon did prove
The ſweet effects of mutual love:
And from that hour, to life's decline,
She bleſs'd the day of Valentine.

A MINUET.



The Welch-Rabbit. *A Country Dance.*



Firſt Co. caſt off one co. ÷ caſt up back again ÷ 1ſt and 2d men foot it to their partners and turn ſides ÷ foot it ſides and turn partners ÷. 1ſt man foot it to the 2d Woman and not turn ÷ 1ſt woman and 2d man the ſame ÷ hands four round 1ſt co. ſlip down the middle one co. ÷ right hands and left ÷

The following ode written by Colley Cibber, Eſq; Poet Laureat, was vocally and inſtrumentally performed at his Majeſty's apartment, adjoining to the council chamber, St. James's on New Year's Day.

Recitative.

AS Rome of old, for Halcyon days,
Sung Io's to Auguſtus praiſe;
So happier Britons to their King,
Redeunt Saturnia Regna ſing.

Chorus.

Redeunt Saturnia, &c.

Air.

Again behold a younger year,
Prolongs his elder empire here;

Still with the ſame paternal care,
The ſun and Cæſar bleſs the year;
Alike their genial influence yields,
For publick nurture, ſertile fields:
While bleſs'd obedience ſings his praiſe,
Glory the royal grant repays.

Recitative.

What prayer to Heaven could kneel for more,
Than ſuch a godlike uſe of power?

Chorus

What prayer to heaven, &c.

Recitative.

So reign'd Eliza, when her Britons bleſs'd
Above the world, the wondering world confeſs'd.
Then firſt was known ſweet liberty to bloom,
Which now to full maturity is come.

Air.

Now from her ſmiles enjoy'd is Cæſar great:
Now beams the luſtre of his crown complete.

Chorus.

Such a period of glory, ſince the firſt Norman King,
No monarch has known, ſave the monarch we ſing.

Duetto.

Long the heroine grac'd her throne:
Longer life has Cæſar known.
Her while truth and virtue raiſe,
Him the patriot King ſhall praiſe.

Chorus.

Such a period, &c.

Air.

Happy Britain! Queen of iſles!
Miſtreſs of a nation's ſmiles:
Godlike while thy monarchs ſhine,
Where's the realm ſhall rival thine?

Chorus.

Such a period of glory, &c.

Recitative.

Sicilian ſiſters ſtrike the lyre;
The lay let Cæſar's praiſe inſpire.
To praiſe undue let art belong,
Truth, truth alone ſublimes the ſong.
The higheſt praiſe to heaven we ſend,
Is, that its laws our lives commend.

Air.

Such be the ſong to Cæſar given;
The praiſe of Cæſar, praiſes heaven:
Where e'er the royal virtues ſhine,
Their beams diſplay the grace divine.

Chorus.

Be joyful! let the grateful world acclaim,
While wond'ring virtue conſecrates his name.

We have been favoured with the following chronological abſtract of the *Engliſh* hiſtory, from a very honourable and judicious gentleman. Such a ſubject could not receive much embelliſhment from poetry; but the poetical ſtile is certainly beſt to imprint ſuch obſervations, eſpecially, on the minds of youth, who are moſt able to retain theſe Remarks in their Memory.

The dates of the reigns of the kings of *England.*

WILLIAM I. 1066.	THE firſt year of WILLIAM the firſt's reign we fix, In the year one thouſand and ſixty ſix.
WILLIAM II. 1087.	In one thouſand and eighty-ſeven his ſon, WILLIAM the ſecond his reign begun.
HENRY I. 1100.	One thouſand one hundred the date o'the year, When HENRY the firſt, our king did appear.
STEPHEN 1135.	Eleven hundred and forty ſave five is the date, When STEPHEN began firſt to govern the ſtate.
HENRY II. 1154.	One thouſand one hundred and fifty four's reckon'd, The date of the reign of King HENRY the ſecond.
RICHARD I. 1189.	After him came to reign King RICHARD the firſt, In one thouſand one hundred and eighty nine juſt.
JOHN. 1199.	His ſucceſſor next is his brother king JOHN, In the Year of our Lord twelve hundred ſave one.
HENRY III. 1216.	In one thouſand two hundred and ſixteen all own, That HENRY the third came next to the throne.
EDWARD I. 1272.	Next EDWARD his ſon took the crown as his due, In the year twelve hundred and ſeventy two.
EDWARD II. 1307.	In th' year thirteen hundred and ſeven we read, That EDWARD the ſecond his ſon did ſucceed.

EDWARD

EDWARD III.	His ſon the third EDWARD, did juſt the ſame thing,
1327.	That is twenty years after he came to be king.
RICHARD II.	In one thouſand three hundred and eighty lack three,
1377.	On the throne next is RICHARD the ſecond, you ſee.
HENRY IV.	In one thouſand three hundred ninety and nine,
1399.	Came in HENRY the fourth of the Lancaſter line.
HENRY V.	In the year fourteen hundred and one Dozen more,
1412.	The People to HENRY the fifth, their King, ſwore.
HENRY VI.	No ſooner paſs ten years away, but his ſon,
1422.	King HENRY the ſixth, is poſſeſt of the Throne.
EDWARD IV.	Fourteen hundred and ſixty the York Line's reſtor'd,
1460.	In the perſon of EDWARD the fourth their liege-lord.
EDWARD V.	Three and twenty years after ſcarce is ſeen on the throne,
1483.	Young EDWARD the fifth, before his life's gone.
RICHARD III.	For that year his baſe uncle, RICHARD the third,
1483.	Kills him, ſeizes the crown, the ſceptre and ſword.
HENRY VII.	But in two years time after, all things were ſoon righted,
1485.	And the white and red roſes in HENRY united.
HENRY VIII.	After him reigned HENRY the eighth his ſon,
1509.	In the year fifteen hundred and ten wanting one.
EDWARD VI.	One thouſand five hundred and fifty ſave four,
1546.	EDWARD the ſixth the diadem wore.
MARY.	In the year fifteen hundred fifty and three,
1553.	Queen MARY began then to reign all agree.
ELIZABETH.	And in fifteen hundred fifty and eight,
1558.	Her ſiſter ELIZABETH felt the crown's weight.
JAMES I.	In ſixteen hundred and two (the queen dead,)
1602.	JAMES king of *Scotland*, came to reign in her ſtead.
CHARLES I.	One Thouſand ſix hundred twenty and five,
1625.	His ſon CHARLES the firſt, to the crown did arrive.
CHARLES I.	But in ſixteen hundred forty and eight,
1648.	Which ought ever, or never to be out of date,
1648.	He was vanquiſh'd by OLIVER, and forc'd to ſubmit
	To the moſt cruel terms that his conqu'rors thought fit.
CHARLES II.	From that time the line of the STUARTS goes on,
1648.	In the perſon of CHARLES the ſecond, his ſon.
CHARLES II.	But ſixty's the year when he was reſtor'd,
1660.	To his crown with almoſt univerſal accord.
JAMES II.	In the year eighty-five accedes to the throne,
1685.	JAMES the ſecond, his brother a bigot well known.
JAMES II.	He ſoon treads down liberty, laws, conſtitution,
1688.	And ſo paves the way for the great revolution.
WM & MARY.	In the year eighty-nine, together are ſeen,
1689.	On the throne king WILLIAM, and MARY his queen.
ANNE.	They dy'd without iſſue, ſo ANNE's Reign's begun,
1701.	In the year one thouſand ſeven hundred and one.
ANNE.	The nation ſhe governed four months and twelve years,
1714.	After her a new race of heroes appears.
GEORGE I.	One thouſand ſeven hundred and fourteen's the date,
1714.	When GEORGE, as his right, claims the rule of the ſtate.

George II.
1727.

His ſon GEORGE the ſecond in the year twenty-ſeven;
Succeeded his father tranſlated to heaven.

Long flouriſh Britain'*s crown in* Brunſwick'*s line,*
As long as ſun, and moon, and ſtars ſhall ſhine!
May laws, religion, liberty and peace,
Laſt with great Brunſwick'*s ſway, 'till Time itſelf ſhall ceaſe!*
T. N.

We have been favour'd with ſeveral other Pieces from our Correſpondents, which, for want of Room, we muſt poſtpone to another Opportunity.

A CHRONOLOGICAL MEMOIR *of* Occurrences,

For *January* 1755.

The political State of EUROPE *for this Month: With a proper Introduction.*

EUrope has enjoyed the Bleſſings attendant on a general peace, ſince the concluſion of the treaty of Aix la Chapelle in 1748. The wars terminated by that treaty, were ſupported by a great effuſion of blood, and expence of treaſure. The war between Great Britain and Spain continued nine years: that kindled in Germany, by the artifices of France, in ſetting the houſes of Brandenburgh and Bavaria to debilitate the houſe of Auſtria, continued eight years: and the war between Great Britain and France, in which moſt of the other European powers were involved, continued four years. When the peace was concluded, the balance of power was endeavoured to be ſecured, by the different parties, who became divided into two grand coalitions: the empreſs queen of Hungary, Ruſſia, Great Britain, the United Provinces, and Sardinia, compoſing the one: France, Spain, the two Sicilies, Pruſſia, and Sweden, forming the other. From that time, a reciprocal jealouſy in the cabinet ſucceeded a general enmity in the field; ſome of the commercial powers have been employed in reſtoring trade, others in creating new branches of commerce: while the military ſtates have been improving their armies, and making themſelves ready to check the firſt daring power who ſhould violate the general tranquility, which ſeems now to be fatally diſturbed by the aſpiring views and inſolent conduct of France, ſtill directed againſt Great Britain, the natural enemy of every ſtate who wantonly aims at ſuch an extenſion of power, as muſt form the foundation of univerſal monarchy, and render the ſtate of men as contemptible as that of beaſts, by expelling freedom from her reſidence, and binding her children in the abject bonds of ſlavery.

Theſe general remarks are neceſſary to the introduction of the preſent political ſyſtem of Europe; which ſeems now to be ſhaken both towards the eaſt and weſt: but if peace cannot be juſtly ſupported, the offended powers may have ability enough to puniſh the violators of treaties with the ſcourge of war.

Ruſſia. The Ruſſian empire, like its own polar ſtar, illumines the northern hemiſphere. Peter the Great laid the foundation of its preſent magnificence; Munich, once the glorious general, and now the miſerable exile, brought the plan of the Czar to perfection; and, under the auſpices of the preſent Czarina Elizabeth, the Ruſſian power not only commands the balance of the north, but greatly influences affairs in the ſouthern dominions of Europe. Count Beſtucheff, who preſides in the Ruſſian adminiſtration, is an able and prudent miniſter: he has prevented any rupture with Sweden; maintained a good underſtanding with Turky; and greatly augmented the felicity of Ruſſia, whoſe inhabitants are pleaſed with the virtues of their grand prince, and the increaſe of his auguſt family.

Sweden. The king of Sweden, being uncle to the grand prince of Ruſſia, has endeavoured to conciliate the differences which have ſubſiſted between the two ſtates ſince the treaty of Abo, in 1743: but, of late, nothing material has happened in Sweden.

Denmark. His Daniſh majeſty, ever ſince his acceſſion to the throne in 1746, has always been attentive to the felicity of his ſubjects; and has ſent orders to his miniſter at Ratiſbon, to guaranty the meaſures taken by the landgrave of Heſſe-caſſel, for maintaining the Proteſtant religion in that country after his death.

Poland. His Poliſh majeſty has left Warſaw, to viſit his electoral dominions; leaving Poland in more tranquility than uſual; for the only public diſpute of any conſequence in that kingdom relates to the poſſeſſors of the eſtates of the ordination of Oſtrog, by virtue of the will of the late prince Sanguſho: but the king has appointed a royal commiſſion to be held at Dubno, to examine into the nature of thoſe poſſeſſions.

Germany. The political affairs of Germany, particularly of the court of Vienna, continue in a very tranquil ſituation; but the eccleſiaſtical ſyſtem has received a violent blow at the court of Heſſe-caſſel, where the hereditary prince has renounced the Proteſtant religion, and embraced the Romiſh faith: however, the ſtates of that country are concerting effectual meaſures for inviolably maintaining their religion, laws, and conſtitutions; particularly, by taking care, that the children of prince Frederick, by the princeſs Mary of Great Britain, ſhall be educated in the proteſtant faith; beſides, that prince has aſſured his royal conſort, that, honouring her virtues, ſhe might reſt aſſured of his ſtrict attention, firmly to obſerve, in reſpect to her, and her children, whatever was ſtipulated relating to the article of religion.

Turky. The Turks have remained in peace on the ſide of Europe ſince the treaty of Belgrade in 1739; which has been entirely owing to the pacific diſpoſition of Mahomet their emperor, who aſcended the Ottoman throne, on the 5th of October 1730, but, unhappily for Europe, this amicable monarch died on the 13th of laſt month, by a ſudden fit of the aſthma, and is ſucceeded by his brother Oſman IIId, who has been inveſted with the imperial dignity without the uſual commotions on ſuch occaſions. The new Sultan has continued all the officers of ſtate in their ſeveral employments; and if France ſhould now be as aſſiduous at the Ottoman ports as ſhe was in the year 1746, perhaps ſhe might not find ſo much difficulty as ſhe did then, in ſtirring up the Turks to invade the Auſtrian dominions.

Italy. The Pope, in a grand conſiſtory, has accepted of the reſignation of the cardinal's cap, by the Infant Don Lewis of Spain: and the ſociety for the propagation of the faith have received advices from China, that the perſecution of the chriſtians in that great empire was entirely ceaſed. Nothing material has happened at the other courts of Italy; except that a ſtop is put to the treaty of commerce negociating between the courts of Naples and London, on account of the difficulty concerning the nature of the goods which are deemed to be contraband in Naples; where mount Veſuvius has lately renewed its eruptions; the lavy, or burning matter, having extended five miles towards the ſouth, on the ſide of San Angelo, and the valley of Scafara.

Portugal. The court of Liſbon, having partly rectified the matters complained of by the merchants of the Britiſh factory, ſeems to apply itſelf to its old purſuit of pacific meaſures.

Spain. The court of Madrid is intent upon the recovery of its marine from the low ſtate into which it was ſunk; and the king has lately made ſeveral military promotions. The French ambaſſador has had ſeveral conferences with the Spaniſh miniſters concerning the armaments that the court of Great Britain is preparing for America; in which he endeavoured to repreſent them in ſuch a light as might give umbrage to the Spaniſh court: but as the marquis de la Enſenada, the tool of France, is out of the adminiſtration; and as general Wall, a well-known friend to England, preſides in the Spaniſh council, it is to be hoped that the French artifices will no longer prevail at Madrid. However, the Spaniards have entirely diſpoſſeſſed the Engliſh logwood-cutters of their ſettlement in the bay of Honduras; where ſuch depredations have more than once occaſioned a rupture between the two crowns.

France. The parliament of Paris, having aſſerted the true ſpirit of a Roman ſenate, have at laſt triumphed over their enemies the clergy; the archbiſhop of Paris being ſent into exile, while the parliament has been honourably recalled by the king, and has happily renewed its functions to the great joy of the people. The ſouthern provinces have been greatly infeſted by a banditti of ſmugglers, headed by one Mandrin, a brave and experienced officer, who has been ſucceſsful in ſeveral engagements againſt the royal troops. The king has appointed M. Moreau de Sechellas, comptroller general of the Finances, to be one of the miniſters of ſtate; and the French miniſtry ſeem to be taking every ſtep towards an open quarrel with Great Britain, who cannot tamely behold the rapacious ſchemes of France in Aſia and America. It is reported, that France has now 97 ſhips of the line, and 50 frigates, beſides gallies; with which ſhe is ready to put her former projects in execution. Indeed, if the French eſtabliſh themſelves on the back of the Britiſh colonies in north America; if they are as ſucceſsful in India, during this interval of peace, as they were during the late war; if they ſhould render themſelves more formidable on the coaſt of Africa; and ſhould rekindle the flames of war in Europe; ſhe may have ſtrength enough to be troubleſome for a time to Great Britain: but the Britiſh navy has been hitherto invincible; it ruined the maritime force of Lewis XIV, and has once deſtroyed that of Lewis XV, and it is not to be feared, but the reſentment of Britain can again ſufficiently puniſh the inſolence of France.

The *United Provinces.* The ſtates general have had long conferences with prince Lewis of Brunſwick, the field-marſhal of the republic; and it is ſuppoſed, that a negociation is upon the tapis for foreign troops; the military ſpirit and commercial intereſt of this republic ſeem to be dwindling into contempt and inability, like her ſiſters of Venice and Genoa.

LONDON.

1. THE Hon. Commodore Kepple was elected member for Chicheſter.

2. Dr. Andrew Didier elected phyſician to the Middleſex hoſpital.

3. Joſeph Gill and William Buck, two highwaymen, were taken, after a very obſtinate reſiſtance.

— Edward Herbert, Eſq; elected Member for Shropſhire.

4. Michael Flemming, ſervant to the Hon. Mr. King, of Albemarle-ſtreet, was ſent by his maſter to the bank to get a note for 500 l. changed for ſmall notes, which, after effecting, he went off with, but was taken at Well's the 7th.

— The bodies of four children, all putrified, except the body of a boy about a month old, ſuppoſed to be lately put there, were found under an arch of the ſtables at the bottom of Bolton-row, near the duke of Devonſhire's gardens, by ſome workmen who were cleanſing a ſhore: the ſkulls of the children ſeemed all to be broke with a hammer.

6. Being twelfth day, it was obſerved at court as a high feſtival.

—The Rt. Hon. the marquis of Wincheſter, without oppoſition, was elected knight of the ſhire for the county of Southampton.

Henry Drax, Eſq; and capt. Auguſtus Pitt, of the foot-guards, were elected members for Wareham.

The following melancholy accident happened at a houſe in St. Giles's: a child of two or three years old going too near the chimney, in the abſence of his mother, the fire caught his cloaths, and ſet them in a blaze. The people on the lower floor, alarm'd by unuſual ſhrieks and cries of the child, ran to its aſſiſtance, and found its face, arms, and one of its hips burnt in a moſt miſerable manner.

7. This day the Houſe of Commons met purſuant to their late adjournment.

— The duke de Mirepoix, the French ambaſſador, arrived at his houſe in Groſvenor ſquare from France.

—The Rt. Hon. the lord Montfort was unanimouſly choſen high-ſteward of Cambridge, in the room of the late lord Montfort, his father, deceaſed.

A gentleman in his coach going near Brentford, and paſſing briſkly a-breaſt of a waggon, the waggon-horſes ſet off as faſt as they could, whereby the driver was thrown under one of the wheels, which went in a line from the hinder part of his body directly over his head. A gentleman paſſing by at the ſame time took up the poor man, expecting he was killed, but it happened he received no other damage than having his lip and chin pretty much cut, which it is thought he will ſoon get over.

9. The Houſe of Peers met, and adjourn'd to Monday next.

The Rt. Rev. the Lord Biſhop of Chicheſter appointed to preach before the Rt. Hon. the Houſe of Peers, the 30th inſtant.

22. The committee of city lands ſold the place of ſword-bearer of this city to Mr. Henry Wentworth, ſurgeon, in friday-ſtreet, for 5550 l.

23. There was a hot preſs for ſeamen.

25. A proclamation was publiſhed in the Gazette for ſeamen, and 30 s. per month for volunteers, 20 s. bounty money.

A Regiſter *of* THEATRICAL ENTERTAINMENTS.

	Drury-Lane Theatre.	Covent-Garden Theatre.
Jan. 1.	*Barbaroſſa.* The Ninth Time.	*The Rehearſal.*
2.	*Barbaroſſa.*	*The Nonjuror.—Harlequin Sorcerer.*
3.	*Barbaroſſa.*	A Burletta.
4.	*Drummer—Proteus,* or *Harlequin* in *China.*	*The Twin Rivals.*

6. *Twelfth*

	Drury-Lane Theatre.	Covent-Garden Theatre.
6.	*Twelfth Night.—Proteus.*	*Beggar's Opera.—Harlequin Sorcerer.*
7.	*The Inconſtant.—Proteus.*	*Careleſs Huſband.—Mock Doctor.*
8.	*Phædra and Hippolitus.—Proteus.*	*The Suſpicious Huſband.—Scapin.*
9.	*Much ado about nothing.—Proteus.*	*The Way of the World.—Harlequin Sorcerer.*
10.	*Merry Wives of Windſor.—Proteus.*	*Oedipus.—Scapin.*
11.	*Conſtant Lovers.—Proteus,*	*Oedipus.—Scapin.*
13.	*Drummer.—Proteus.*	*Provoked Huſband.—Harlequin Sorcerer.*
14.	*Suſpicious Huſband.—Proteus.*	*Revenge.—Knights.* for benefit of public char.
15.	*Love for love.—Proteus.*	*Oedipus.—Scapin.*
16.	*Orphan.—Proteus.*	*Hamlet.—Scapin.*
17.	*Provoked Wife.—Proteus.*	*Careleſs Huſband.—Harlequin Sorcerer.*
18.	*Careleſs Huſband.—Proteus.*	*Double Dealer.—Contrivances.*
20.	*Stratagem.—Proteus.*	*Beggar's Opera.—Harlequin Sorcerer.*
21.	*The Fop's Fortune.—Proteus.*	*Funeral.—Scapin.*
22.	*The Man of Mode.—Proteus.*	*Conſtant Couple.—Harlequin Skeleton.*

BIRTHS.

Jan. 3. The lady of William Southwell, Eſq; delivered of a ſon, which died ſoon after its birth.

5. The lady of Edward Blount, Eſq; ſafely delivered of a ſon and heir.

8. The lady of Sir James Dunbar, Bart. ſafely delivered of a ſon and heir.

12. The lady of James Digges Latouche, Eſq; ſafely delivered of a ſon.

17. The lady of the Right Hon. Lord Duncannon ſafely delivered of a daughter.

The lady of Thomas Foley, Eſq; Member for Droitwich in Worceſter-ſhire, ſafely delivered of a ſon.

24. The lady of Sir Thomas Parkyns, Bt. of Bunny-Park, in the county of Nottingham, delivered of a ſon and heir.

MARRIAGES.

Jan. 2. Mr. John Berwick, an eminent haberdaſher in Friday-ſtreet, to Miſs Betſy Lodge, (daughter of Mr. John Lodge, an eminent packer in Little St. Helen's.)

4. Mr. William Marcellus, an eminent painter, to Miſs Anna Amelia Moyſe.

7. Mr. Hughs, an eminent fellmonger, to Miſs Sally Smith, with a fortune of 200 l. per annum.

11. The Rt. Hon. the Earl of Dartmouth, to Miſs Francis Katherine Gounter Nicholl, only daughter and ſole heireſs of Sir Charles Gounter Nicholl, Knight of the Bath, deceaſed, deſcended in the direct male line from Sir Hugh Gounter, Knight, who was ſtandard-bearer to K. William the Conqueror, and was ſeated at Rackton, in the county of Suſſex, which continued to be the chief ſeat of his deſcendants, till the death of Sir Charles Gounter (who took the name of Nicholl by act of parliament): and upon this marriage, the poſſeſſion of that eſtate and many other real eſtates, and a vaſt fortune in money, was transferred to a young nobleman, whoſe perſonal qualifications (as alſo the lady's) are ſo well known, that they need not be mentioned upon this occaſion.

13. The Rev. Mr. Foyle, Rector of Kimpton, Hants, to Miſs Hayter, only daughter of Thomas Hayter, Eſq; of Saliſbury, a young lady with 10000 l. fortune.

15. Mr. William Burton, timber merchant, to Mrs. Winnell.

DEATHS.

Jan. 1. Lord Montford. *Suddenly.*

Rev. Mr. Wilſon, lecturer of St. John's Southwark.

2. Sir James Lowther, Bart. eſteemed the richeſt commoner in England.

5. At Cambridge, Mr. Wendy, alderman of that town.

6. In the 83d year of his age, Richard Carter, Eſq; his Majeſty Chief Juſtice for South-Wales.

9. The Right Hon. Auguſtus Berkeley, Earl of Berkeley, Viſcount Durſley, and Lord Burkeley of Berkeley-caſtle in Glouceſterſhire, Ranger of Dean Foreſt, Lord Lieutenant and Cuſtos Rotulorum of Clouceſterſhire, and Knight of the Thiſtle. His lordſhip married, May 7, 1744, Elizabeth; daughter to Henry Drax, Eſq; member of parliament for Wareham in Dorſetſhire, by whom he had Lord Durſley, now Earl of Berkeley, who is in the 10th year of his age, and ſeveral other children.

10. Mr. Thomas Chitty, only ſon of Thomas Chitty, Eſq; alderman of Tower Ward.

11. The Hon. Mrs. Townſhe[illegible], lady of the late colonel Townſhend, and daughter of the late Lord William Powlett.

Mrs. Read (who died a few days ſince at her houſe in Arlington-ſtreet) has left 500 l. to diſtreſſed widow gentlewomen, and 100 l. to poor clergymen's widows.

13, Mr. Monk, many years one of the grooms of the chambers to his Majeſty.

14. In the 76th year of his age, Mr. Thomas Brewer, ſtationer, in Ludgate-ſtreet.

B—K

B—— KR—— TS.

Richard Falkner, of Blackburne, merchant.
John Myers, of Preſton, merchant.
John Barford, of Ipſley, tanner.
John Gatward, of Cambridge, coal-merch.
William Hopkins, of St. James's Weſtminſter, carpenter.
Walter Colquhoun, of Norwich, linnen-drap.
Andrew Atchiſon, of Soho, linnen-draper.
Alexander Smith, of Bloſſom's Inn, merch.
William Clarke, of Ludlow, mercer.
Solomon Jacobs, of Norwich, dealer & chap.
Joſhua and Richard Harle, of St. Buttolph without Aldgate, grocers.
Thomas Warner, of Huntingdon, merchant.
John Mackintoſh, of London, ſurgeon and apothecary.
James Nicholſon, jun. of North Bailey, Durham, Innholder.
Charles Macklin, of Cov. Garden, vintner and coffeeman.
Daniel Briſſanden, of Canterbury, grocer.
Thomas Emerſon, of Barnard-caſtle, Durham, butcher.
John Gatacre, of St. George Bloomſbury, ironmonger.

BILL *of Mortality from* Dec. 31 *to* Jan. 21.

Buried		Chriſtened	
Males 694	1412	Males 464	885
Females 718		Females 421	
Under 2 years old	435		
Between 2 and 5	119	Buried,	
5 and 10 —	35	Within the walls	113
10 and 20 —	40	Without the walls	335
20 and 30 —	120	*Mid.* and *Surry*	661
30 and 40 —	153	City & Sub. *Weſt.*	303
40 and 50 —	162		
50 and 60 —	116		1412
60 and 70 —	119		
70 and 80 —	71	Weekly *Jan.* 7.	441
80 and 90 —	41	14.	505
90 and 100 —	1	21.	466
100 and 109 —	0		
	1412		1412

BOOKS, publiſhed in January, 1755.

BATT's ſermon, at the election of a mayor and Sheriffs at Briſtol. 6 *d.*

Bally's juſtice of the Supreme Being. 1*s.* (*Dodd.*)

Barthelemy's (Abbé) reflections on the alphabet and language of Palmyra. Tranſlated from the French. 6*d.*

Coriolanus, or the Roman Matron. A tragedy. Taken partly from Shakeſpear, and partly from Thomſon. 8vo. 1 *s.* 6 *d.*

Courtier and Patriot. An epiſtle to his grace the duke of Newcaſtle. *Fol.* 6 *d.*

Carew's hiſtorical Right of Elections. *Fol.* (*Nourſe.*)

The Card. 2 Vols. 12mo *Calf.* (*Newbery.*) 6*s.*

Eſſay on the liberty of the preſs, chiefly as it reſpects perſonal ſlander. 8vo. (*Raymond.*) 1*s.*

Extract of the Bon Mots, or Witty Sayings of little brother Andrew, againſt the Jeſuiſts. (*Baldwin*) 6 *d.*

Jones's ſermon, at St. Botolph, Biſhopſgate, Nov. 24. 1754. 6*d.*

Folly predominant, or the Town taken in; with the palpable deception of the Orators: with their effigies. *Fol.* (*Carpenter*) 1*s.*

Free thoughts and bold truths, on the preſent poſture of affairs. (*Dodſley.*) 6*d.*

Free and impartial remarks on the real importance of the whale fiſhery. In a letter to a member of parliament. By a merchant. (*Cooper.*) 1*s.*

Griffin's (Rev. Mr.) Scripture account of a future ſtate conſidered. (*Swan.*) 1*s.*

Great Britain's poverty and diſtreſs, exemplified by the Eaſt India Monopoly, with ſome hints towards a remedy. (*G. Bible.*) 6*d.*

Grand Queſtion, debated after the dialogical manner of Lucian, for aboliſhing the public debt. (*Baldwin.*) 1*s.*

Green's Diſſertation on enthuſiaſm. (*Oliver.*) 2*s.* 6*d.*

Hudderford's (Rev. Dr.) proper reply to a pamphlet entitled, a defence of the rector, and fellows of Exeter College. (*Rivington.*) 6 *d.*

Hay's tranſlation of ſelect epigrams of Martial. Latin and Engliſh. 12mo. *Calf* 3*s.* Engliſh only. 8vo. *Blue pa.* 2*s.*

Hiſtorical diſſertation on the books of the New Teſtament; or an enquiry into their authority and particular character. Compos'd from original authors. 5*s.*

Queries humbly offered to Count Zinzendorf. 6 *d.*

Immortality; or the conſolation of human life. A monody. (*Dodſley.*) 1 *s.*

Ireland in tears; or a letter to Sir Andrew's eldeſt daughter's youngeſt ſon. By Major Sawney M'Cleaver, an officer on the Iriſh eſtabliſhment. 1*s.*

Letter from a member of the univerſity of Oxford, to a gentleman in the country: containing a particular account of a watch-plot lately diſcovered there (*Mears.*) 4*d.*

Liberty regained; or Life of W. S, Eſq; a Poem. Inſcribed to the Earl of Cheſterfield. (*Woodgate, &c.*) 6*d.*

EACH DAY's *Price of* STOCKS, *in* JANUARY 1755. ☞ Books ſhut, is ſignified thus, ———

Days	Bank Stock.	E.-India.	South Sea	S. Sea old An. 1ſt Su	S. Sea old A. 2d Sub.	S. Sea An. new 1ſt S.	S. Sea An. 2d Subſc.	3½ Ba. An 1ſt Subſc.	3½ Ba. An 2d Subſc.	3½ *per* C. India An.	3 *per* Cent India An.	Ba. 3 *per* Cents.	3 *per* Cent An. 1751.	India Bon præm.	B. Cir. *per* *l.* *s.* *d.*	Wind at *Deal.*	Days
1	———	———	———	104⅜a½	103	———	———	104⅜a½	103a⅛	102⅜a½	102a⅛	———	———	105s a 06	1 2 6	E N E	1
2	133¼a⅜	———	———	104⅝a¾	103a⅛	———	———	104⅜a½a⅜	103a⅛a¼	102½	102¼	———	———	105s a 00	Do	N E	2
3	133¼	———	———	104⅝a¾	103⅛	———	———	104¼a⅜	103a⅛	102½a⅝	102⅛a¼	———	———	104s a 05	Do	Do	3
4	———	———	———	104⅝a¾	103a⅛	———	———	104¼a⅜a¼	103a⅛	102½	102⅛a¼	———	———	104s a 05	Do	N b W	4
5	Sunday															N b E	5
6	133⅛a133	———	———	104¾	103⅛	———	———	104¼	103a⅛	102½	102⅛a¼	———	———	103s a 04	Do	W b W	6
7	133a⅛	———	———	104⅞	103⅛	———	———	104¼a⅛	103a⅛	102½	102⅛a¼	———	———	103s a 04	Do	N W	7
8	133	———	———	104¼a⅞	103⅛a¼	———	———	104¼	103	102½a¾	102⅛a¼	———	———	102s a 03	Do	N W	8
9	133	———	———	104⅞	103⅛a½	———	———	104¼	103a102⅞	102⅜a½	102¼	———	———	102s a 03	Do	W N W	9
10	132¾	———	———	104⅝a¾	103a⅛	———	———	104⅛a¼	102⅞a103	102⅜a½	102⅛a¼	———	———	103s a 04	Do	Do	10
11	No Price.	———	———	104⅝a¾	103a⅛	———	———	104⅛a1	102⅞a103	102⅜a½	102⅛a¼	———	———	103s a 04	1 2 6a5s	W S W	11
12	Sunday															S W	12
13	No Price.	———	———	104⅝a¾	103a⅛	———	———	104⅛a¼	102⅞a103	102⅞a½	102¼	———	———	104s a 05	Do	Do	13
14	Do	———	———	104⅝a¾	103a⅛	———	———	104a103¾	102¾a⅞	102¼	102⅛	———	———	103s a 04	1 5 0	N b E	14
15	132½	———	———	104⅝a¾	102⅞a103	———	———	103⅞a104	102¾	102⅛a¼	102	———	———	103s a 04	Do	N E	15
16	132½	179½	———	104⅝a¾	103a⅛	———	———	103⅞a104	102¾a⅞	102¼	101⅞a102	———	101½	104s a 05	1 2 6a5s	E S E	16
17	132½	179¾	———	104⅝a¾	103a⅛	———	———	103⅞a124	102¾a⅞	102¼	101⅞a102	———	101¼	105s a 00	1 2 6	Do	17
18	No Price.	171¾a179	———	104⅝	———	———	———	103⅝a¾	102⅝	102⅛a¼	101⅞	———	101⅞	105s a 00	1 2 6	W S W	18
19	Sunday															S S W	19
20	No Price.	No Price.	———	103½	No Price.	———	———	103⅞a102⅞	No Price.	101	No Price.	———	100¼a100	103s a 95	Do	S b W	20
21	128a130	175½	———	102¾a101½	No Price.	———	———	101¾a101½	100¼a100	No Price.	No Price.	———	98¾a99	90s a 75	Par.	S	21
22	130a129	175½a¾	———	101½	99¾a100	———	———	101¼	No Price.	99¾a⅞	99	———	99¼	70s a 17	Do	S E b E	22
23	130	175a½	———	No Price.	100⅜a½	———	———	101¼a⅝	100⅛a½	No Price.	100	———	100¼	88s a 06	0 12 6	E b N	23
24	130a¼	176	———	101½a103	No Price.	———	———	101¾a102⅛	100¼a½	100¼	100	———	100½	82 a 03s	Do		24
25	No Price.	No Price.	———	103	No Price.	102¼	———	101¾a102	100⅝a¾	100¼	Par.	———	100⅞	82s a 03	0 15 0	N N E	25
26	Sunday															N E	26
27	130	175	———	102½a103	No Price.	———	———	101¼a⅝	No Price.	Par.	No Price.	———	99⅝a¼	82s a 80	0 12 6	Do	27

Prices Corn.	Mark-Lane.	Baſingſtoke.	Reading.	Farnham.	Henley.	Guildford.	Warminſter.	Devizes.	Glouceſter.	London.
Wheat	24s to 26s qr.	06l to 7l load	06l 17s 6d load	06l 15s load	07l 12s 6d load	07l 5s od load	27s to 34s qr.	24s to 35s qr.	5s od buſh.	W. Pec. Loaf 19d
Barley	12s to 14s 6d	14s to 17s qr.	15s to 18s 6d qr	14s to 16s qr.	14s to 17s qr.	16s to 16s 6d qr	13s to 16s	12s to 16s	2s to 2s 4d	
Oats	10s to 13s od	13s to 14s od	14s to 17s od	15s to 16s	13s to 18s	11s to 14s od	11s to 12s	12s to 13s	1s 6d to 8d	
Beans	17s to 19s od	19s to 23s od	19s to 23s od	20s to 21s	20s to 22s	24s to 26s	23s to 27s	22s to 25s	2s 8d to 3s	

Miſcellaneous Correſpondence,

For *FEBRUARY,* 1755.

The ESSAY on the *Uſefulneſs* of MATHEMATICAL LEARNING, *continued from Page 2 of our laſt.*

The ſecond advantage which the mind reaps from *mathematical* knowledge, is a habit of *clear, demonſtrative,* and *methodical* reaſoning. We are contrived by nature to learn by imitation more than by precept: and I believe, in that reſpect, reaſoning is much like other inferior arts (as *dancing, ſinging,* &c.) acquired by practice. By accuſtoming ourſelves to reaſon cloſely about quantity, we acquire a habit of doing ſo in other things. It is ſurprizing to ſee what ſuperficial, inconſequential reaſonings ſatisfy the moſt part of mankind. A piece of wit, a jeſt, a ſimile, or a quotation of an author, paſſes for a mighty argument: with ſuch things as theſe are the moſt part of authors ſtuffed: and from theſe weighty premiſes they infer their concluſions. This weakneſs and effeminacy of mankind, in being perſuaded where they are delighted, have made them the ſport of orators, poets, and men of wit. Thoſe *lumina orationis* are indeed very good diverſion for the fancy, but are not the proper buſineſs of the underſtanding; and where a man pretends to write on abſtract ſubjects in a ſcientifical method, he ought not to debauch in them. Logical precepts are more uſeful; nay, they are abſolutely neceſſary for a rule of formal arguing in public diſputations, and confounding an obſtinate and perverſe adverſary, and expoſing him to the audience, or readers. But in the ſearch of truth, an imitation of the method of the *geometers* will carry a man further than all the *dialectical* rules. Their *analyſis* is the proper model we ought to form ourſelves upon, and imitate in the regular diſpoſition and gradual progreſs of our enquiries; and even he, who is ignorant of the nature of *mathematical analyſis,* uſes a method ſomewhat analogous to it. The *compoſition* of the *geometers,* or their method of demonſtrating truths already found out, viz. *by definitions of words agreed upon, by ſelf-evident truths, and propoſitions that have been already demonſtrated,* is practicable in other ſubjects, though not to the ſame perfection, the natural want of evidence in the things themſelves not allowing it; but it is imitable to a conſiderable degree. I dare appeal to ſome writings of our own age and nation, the authors of which have been mathematically inclined. I ſhall add no more on this head, but that one, who is accuſtomed to the methodical ſyſtems of truths, which the *geometers* have reared up in the ſeveral branches of thoſe *ſciences* which they have cultivated, will hardly bear with the confuſion and diſorder of other *ſciences,* but endeavour as far as he can to reform them.

Thirdly, *mathematical* knowledge adds a manly vigour to the mind, frees it from *prejudice, credulity,* and *ſuperſtition.* This it does two ways, *1ſt,* by accuſtoming us to examine, and not to take things upon truſt. *2dly,* By giving us a clear and extenſive knowledge of the ſyſtem of the world; which, as it creates in us the moſt profound reverence of the almighty and wiſe creator; ſo it frees us from the mean and narrow thoughts which ignorance and ſuperſtition are apt to beget. How great an enemy *mathematics* are to ſuperſtition appears from this, that in thoſe countries, where *Romiſh Prieſts* exerciſe their barbarous tyranny over the minds of men, *aſtronomers*, who are fully perſuaded of the motion of the earth, dare not ſpeak out: but though the *inquiſition* may extort a recantation, the *Pope* and a general council too will not find themſelves able to perſuade to the contrary opinion. Perhaps this may have given occaſion to a calumnious ſuggeſtion, as if *mathematics* were an enemy to religion, which is a ſcandal thrown both on the one and the other; for truth can never be an enemy to true religion, which appears always to the beſt advantage, when it is moſt examined.

———*Si propius ſtes,*
Te capiet magis.———

On the contrary, the *mathematics* are friends to religion; inaſmuch as they charm the paſſions, reſtrain the impetuoſity of imagination, and purge the mind from error and prejudice. Vice is error, confuſion, and falſe reaſoning; and all truth is more or leſs oppoſite to it. Beſides *mathematical* ſtudies may ſerve for a pleaſant entertainment for thoſe hours, which young men are apt to throw away upon their Vices; the delightfulneſs of them being ſuch, as to make ſolitude not only eaſy, but deſirable.

What I have ſaid may ſerve to recommend *mathematics* for acquiring a vigorous conſtitution of mind; for which purpoſe they are as uſeful, as exerciſe is for procuring health and ſtrength to the body. I proceed now to ſhew their vaſt extent and uſefulneſs in other parts of knowledge. And here it might ſuffice to tell you, that *mathematics* is the *ſcience* of quantity, or the *art* of reaſoning about things that are capable of *more* and *leſs*, and that the moſt part of the objects of our knowledge are ſuch: as matter, ſpace, number, time, motion, gravity, &c. We have but imperfect ideas of things without quantity, and as imperfect a one of quantity itſelf without the help of *mathematics*. All the viſible works of God almighty are made in *number*, *weight*, and *meaſure*; therefore to conſider them, we ought to underſtand *arithmetic*, *geometry*, and *ſtatics*: and the greater advances we make in thoſe arts, the more capable we are of conſidering ſuch things, as are the ordinary objects of our Conceptions. But this will farther appear from particulars.

(*To be continued*)

We make no doubt but the public will think themſelves highly obliged by the following accurate, and moſt uſeful obſervations; ſince we cannot but be ſenſible they are the beſt means which nature affords for diſcovering the longitude of places, and conſequently are of the laſt importance for perfecting the art of navigation. Such obſervations are alſo of great uſe in ſettling the theorems of the motions of thoſe ſecondary planets.

ASTRONOMICAL OBSERVATIONS *in the Year* 1754, *at* Newport, Salop.

	H.	′	″	
Jan. 1ſt. at	8	08	03	*Jupiter*'s 1ſt Satellite immerged.
Same day at	8	32	56	The 3d Satellite immerged.
Jan. 5, at	9	14	51	A ſtar of the 3d magnitude near *Aldebaran* immerged behind the *Moon*'s S. E. limb, at 10^h 06′ 51″ it emerged S. W.

	H.	'	''	
Same day at	10	35	50	A ſtar of the 4th magnitude immerged behind the E. N. E. limb.
at	11	44	21	it emerged full weſt.
Feb. 6th, at	07	52	00	*Jupiter*'s 3d Satellite emerged, not out of the ſhadow, but from behind the body, at which time they ſeemed to touch each other.
Same day at	10	16	00	The E. N. E. limb of the *Moon* occulted a ſtar of the 3d magnitude, it being cloudy for a few minutes, the emerſion could not be nicely determined, but was nearly at $10^h\ 52'$. The ſtar is marked A in *Senex*'s *Zodiack*, and is to be found in one of the ſmall ſouthern *claws* of the *Crab*.
Feb. 9th, at	08	46	00	*Jupiter*'s 1ſt Satellite emerged from *behind his body*.
Feb. 17th, at	09	00	00	*Jupiter*'s 3d and 4th Satellite appeared very near each other, and
at	09	20	00	ſo cloſe as to appear but as one Satellite.
Mar. 21ſt, at	07	57	30	*Jupiter*'s 3d Satellite emerged from his ſhadow.
April 9th, at	07	27	00	*Jupiter*'s 4th immerged, clouds intervening the emerſion was inviſible.
Apr. 19th, at	09	36	13	*Jupiter*'s 1ſt Satellite emerged.
May 2d, at	11	17	04	The N. E. limb of the *Moon* occulted a ſtar of the 4th, marked ξ in the north *claw* of the *Lion*; the emerſion was at $12^h\ 15'$ full weſt.
May 3d,				Between the times of $8^h\ 00'$ and $8^h\ 02'$ happened an emerſion of the 3d Satellite, but clouds prevented an exact obſervation.
May 10th, at	12	05	00	*Jupiter*'s 3d Satellite emerged.
Same day at	13	58	00	The ſtar marked ρ in 16^d of ♑ was occulted by the *Moon*, the emerſion was at $15^h\ 20'$, the ſtar paſſed central.
May 19th, at	11	35	30	*Jupiter*'s 2d Satellite emerged; and at $11^h\ 49'\ 15''$ the firſt Satellite emerged.
July 28th, at	10	47	15	A ſtar of the 4th magnitude marked γ between the *claws* of the *Scorpion*, was occulted by the *Moon*'s N. E. limb. The *Moon* being very near the horizon, the emerſion could not be ſeen.
Aug. 31ſt, at	10	23	56	A ſtar of the 4th magnitude marked θ in the ſide of ♒ immerged behind the *Moon*'s north limb, and emerged at $10^h\ 54'$ N. W.
Nov. 21ſt, at	08	00	00	A ſtar of the 5th magnitude marked ρ in the ſide of ♒ immerged behind the *Moon*'s eaſtern limb, and emerged at $9^h\ 14'\ 30''$ N. W.
Nov. 24th, at	18	29	45	*Jupiter*'s 1ſt Satellite immerged.
Dec. 16th, at	13	15	30	The 4th Satellite began to immerge, and at $16'\ 30''$ it was quite hid.

J. P. H.

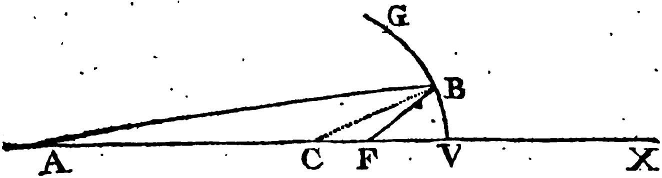
As the Ephemeron Fly *has always been looked upon as the moſt extraordinary production of nature, in regard to its* ſingular ſhort period of life, *we ſhall entertain our readers with a ſhort hiſtory of this moſt curious animal in our next number*;

and here only preſent them with a microſcopic view of the nympha *ſtate of it; mo accurate and exact to the life, ſince every part of it was adjuſted and meaſured wit a* Micrometer. *This we hope will be the more acceptable, as we are well ſatisfied n true delineation of it is any where elſe to be found. And the public may be aſſured, that whatever they find in our plates of this kind is a juſt repreſentation of nature, viewed by our own eye, and drawn by our own hand.*

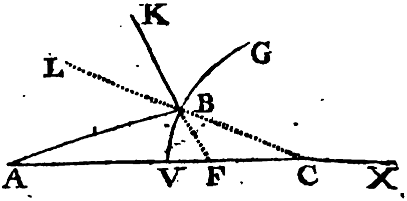
B. M.

As ſeveral of our readers may deſire us to illuſtrate the important and curious diſcovery of the Harmonical Reflection of Light, *(mentioned in page* 8, *of* THEOLOGY) *we give here, agreeable to our promiſe, the following mathematical demonſtration.*

Concave.



Convex.



LET VG be the reflecting ſurface of the mirrour, convex or concave; AX its axis, V the vertex, and C the center; alſo let A be the radiant point, or place of the object, AB a ray of light incident on the mirrour in the point B, and BF the reflected ray meeting the axis in the point F, which is the focus, or place of the image. Put $CB = r$, $AV = d$, and $FV = f$; then we ſhall hereafter ſhew, that $\frac{dr}{2d+r} = f$ in the convex ſpeculum, and $\frac{-dr}{2d-r} = f$, in the concave one; whence we have the analogy $d:d+r::f:r-f$, that is, $AV:AC::VF:FC$, in the *convex*; and (when $2d$ is greater than r) we have $d:d-r::f:r-f$, or $AV:AC::VF:FC$, in the *concave* mirrour: whence the line, or axis, is divided *harmonically* in the points A, V, F, C.

B. M.

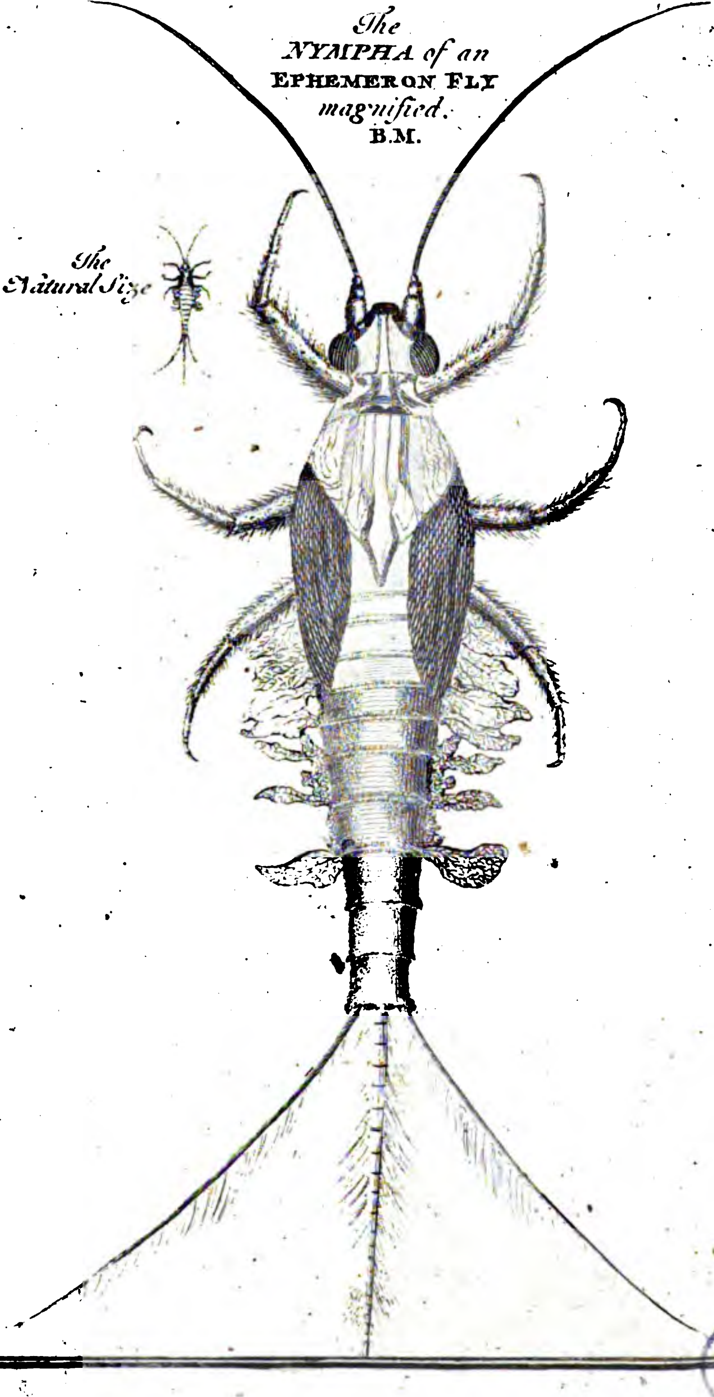
SIR,

I have ſent anſwers to the ſecond and third Queſtions in Mr. Martin's *Magazine. I wiſh ſucceſs to the Undertaking, and am Yours,* &c.

ROB. HALL.

Queſtion 2.

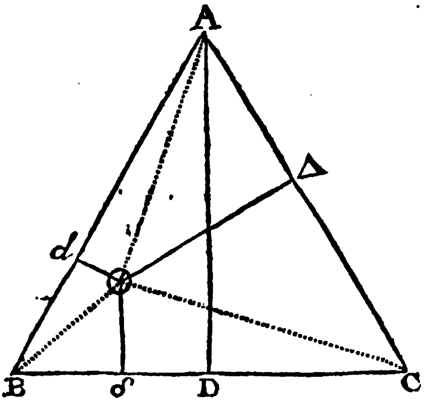
DRaw lines from the point aſſumed to the angles of the triangle, which will divide it into three triangles; whoſe perpendiculars call x, y, and z, and the perpendicular of the equilateral triangle u, and its ſide $2a$. Then, by the common theorem for meaſuring triangles, ax, ay, and az, will be the areas of the three triangles, and au the area of the whole triangle. But the whole is equal to all its parts: therefore $au = ax + ay + az$, and divided by a, $u = x + y + z$, W.W.D.



The NYMPHA of an EPHEMERON FLY magnified.

B.M.

A Demonſtration of the 2d Queſtion.



DRaw the equilateral triangle ABC, and from the < A let fall the perpendicular AD; then let any point O be aſſumed within the triangle ABC, from which let fall the perpendicular O*d*, Oδ, OΔ, and draw OA, OB, OC. Then the triangles ABC, OAB, OBC, OCA, having equal baſes, will be as their attitudes, *i.e.* ABC : AD :: OAB : O*d* :: OBC : Oδ :: OCA : OΔ (and therefore) :: OAB + OBC + OCA : O*d* + Oδ + OΔ, but OAB + OBC + OCA = ABC, and conſequently O*d* + Oδ + OΔ = AD. *Q. E. D.*

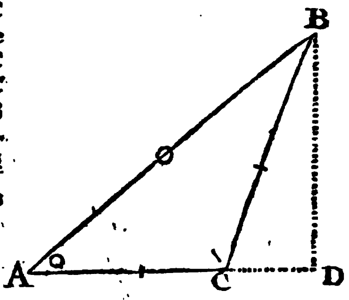
Solution of the 3d Queſtion, By R. R.

BIſect the vertical angles and put AB = *a*, BC = *b*, baſe = *x*, biſecting line = *y*, ſine of ½ vertical angle = ſ ſupplement of the given vertical angle = C. Then (*Euc.* 3. 6.) $a+b : x :: a : \frac{ax}{a+b} =$ AD, after the ſame manner $\frac{bx}{a+b} =$ DC. Then $\frac{ax}{a+b} : ſ :: y : \frac{ſya+ſyb}{ax} =$ ſine angle A. And $\frac{ſya+ſyb}{ax} : b :: c : x \therefore bc = \frac{ſya+ſyb}{a}$ And $y = \frac{abc}{ſa+ſb}$ is known. Again by *Lemma*, p. 238. Mr. *Simpſon*'s algebra, $y^2 = ab - \frac{abx^2}{\overline{a+b}|^2}$, whence $x^2 = \frac{\overline{ab-y^2} \times \overline{a+b}|^2}{ab}$ which gives theſe two Theorems. 1. As the Sum of the ſides multiplied by the ſine of half the vertical angle, is to the product of the ſides :: ſo is the ſine of the ſupplement of the vertical angle : to the biſecting line. 2. As the product of the ſides : is to the ſquare of the ſum of the ſides :: ſo is that product minus the ſquare of the biſecting line : to the ſquare of the baſe, whoſe ſquare root = 37. *Q. E. I.*

Solution to Queſtion 3. By S. Smith *of* Darlington.

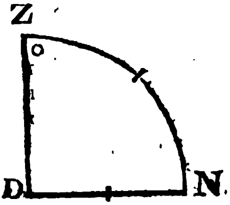
IN the triangle ABC we have AC = 20, BC 25 and ACB = 110°. From B let fall the perpendicular BD on AC produced, then in the △ CBD we have BCD = 70° = the ſupplem. ACB, and BC = 25. Therefore, as Rad. : BC :: 1. BCD : BD = 23.49. And again, as Rad. : BC :: 1. CBD :: CD = 8.55. Now AC + CD = AD = 28.55. And $\overline{\overline{AD}|^{2}+\overline{BD}|^{2}}|^{\frac{1}{2}}$ = AB (per *Euc.* 47. 1) = 36.97. Laſtly, as AB : 1. ACB :: BC : BAC = 59° 27′.

Q. E. F.

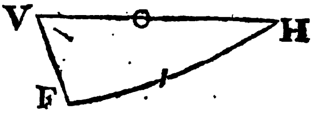


Anſwer to Queſtion 4. By the ſame.

IN the ſpherical △ ZND let ZN be an Arc of the Merid. = Comp. Lat. = 85°, and ZD an Arc of the Azim. cutting the hour-line DN at right angles in D, now DN = comp. ⊙ decl. = 67° 58′; therefore, per ſpherics, as 1. ZN = 85° : Rad. :: 1. DN 67° 58′ : 1. DZN = 68° 31′ the greateſt azimuth from the north.



Then for the amplitude, let ♈ H be an Arc of the horizon, ♈ E an Arc of the equat. EH an Arc of an hour-line; then will E ♈ H be comp. Lat. 85° and EH = ⊙ declin. 22° 2′ to find ♈ H the amplit.



As 1. E ♈ H : 1. EH :: Rad : 1. ♈ H = 22° 7′ = the Sun's ortive amplitude northerly.

Q. E. F.

We have alſo received ingenious ſolutions to the 2d queſtion by Mr. S. Smith, by Mr. J. M. Tudor, Mr. R. R. &c. alſo to the 3d queſtion by Mr. Hall; but are obliged to omit them for want of room.

Harpſwell, Feb. 15th, 1755.

SIR,

IF you think the following queſtions deſerve a place in your magazine, by inſerting the ſame, you will have a conſtant contributor of

Your moſt obedient ſervant,

W. Bevil.

Queſtion 5.

GIven three opaque ſpherical bodies, A, B, and C, at *a*, *b*, and *c*, diſtance from one another: Required, at what diſtance from each ball, a luminous ſpherical body D, of a leſs given magnitude, may be placed, ſo as to enlighten the moſt ſurface poſſible of the other three, when all their centers lie in the ſame plane?

Que-

Queſtion 6.

GIven the abſciſſa of a catenary = 60, and its correſponding ſemi-ordinate = 40, to find its leaſt circumſcribing triangle? And alſo the leaſt cone, that will circumſcribe the ſoild, formed by the rotation of the catenary about its axis?

A PARADOX.

Place nine fifteens, to make a ſum;
That which may be, a minimum?

Queſtion 7. By S. SMITH *of* Darlington.

A Gentleman has in his garden, Lat. 54° 33′ N°. an octagonal pyramid, whoſe ſlant height is 17 yards 15 inches, and the periphery of the baſe ¼ of the ſame; alſo a pentagonal pyramid ſtands S. E. by S. of the former. As he was muſing in his garden on *May* 21, 1754, he obſerved the apex of the ſhadow, made by the pentagon, fell at the neareſt corner of the baſe of the other; but on *February* the 3d following, he found the vertices of the ſhadows coincided. Required, their perpendicular heights, central diſtance, and time of each obſervation.

To the AUTHOR.

SIR,

IT is aſſerted by anatomiſts, that the blood is carried from the left venticle of the heart to the exterior parts of the body along the arteries, and is conveyed back by the veins. I am at a loſs to know, that, when a limb is cut off, how the blood returns to the heart, as it is moſt certainly ſtopped in its courſe at the amputation.

Therefore, I ſhould eſteem it as a great favour, to be informed in this matter, by any ingenious perſon, who has ſufficient condeſcention to deliver his ſentiments in ſuch terms as are eaſily underſtood.

On STELLA.

Who can behold ſuch beauty and be ſilent? OTWAY's ORPHAN.

SYLVIA may boaſt the bright, the ſparkling Eye,
While, at her feet, the wounded lovers ſigh.
Like the ſweet roſe the cheeks of *Cynthia* glow;
And *Lucia*'s breaſts excel the new-fall'n ſnow.
The iv'ry rows of blooming *Flavia* grace,
And beauty add to *Flavia*'s youthful face.
For coral lips *Lucinda* claims the prize,
But ah! how ſoon ſuch ſhort-liv'd beauty dies!
For ſhape with *Marcia* none could e'er compare:
Belinda's pride dwells only in her air.
In *Celia*'s generous mind her glory lies;
She aſks not coral lips, or ſparkling eyes.
Beauties on each in diff'rent ſhapes diſplay'd,
And diff'rent charms adorn each blooming maid.
But in bright *Stella* all thoſe charms we find,
Of eyes, cheeks, teeth, lips, breaſts, ſhape, air, and mind.
Whene'er ſhe ſpeaks a ſecond *Pallas* talks;
Whene'er ſhe ſteps a ſecond *Venus* walks;
What graceful beauties in her [*] verſes ſhine!
What noble thoughts adorn each am'rous line!
What flow of wit, and praiſe to her belong!
Bright *Stella*'s wit would grace a *Dryden*'s ſong.
Beauty will haſte, will quickly fade away,
But *Stella*'s virtues never will decay;
But, like a rock, (whoſe brave, unſhaken ſides
Boldly reſiſt and ſtem the laſhing tides)
Amid' the ſhocks of time will ſtand ſecure,
And ſcorn to pay obeiſance to its pow'r.
See how ſhe walks! majeſtically treads!
See with what graceful air the dance ſhe leads!
See powder'd ſlaves on *Stella*'s ſteps attend,
And all, alike, her heav'nly form commend!
At ev'ry ball the peerleſs *Stella*'s ſeen;
She looks a goddeſs, and ſhe moves a queen.
Go on, brave [†] youth, undaunted dare to run,
Fearleſs purſue the courſe you have begun;
Fly

---

[*] *Alluding to ſome verſes ſent by her to Mr.* ———.

[†] *Mr.* ———, *one of the lady's admirers.*

Fly to the nymph, of *Stella*'s charms approve,
Become the captive to the queen of love.
Should you be doom'd, or dare, in fields of blood
To ſhew your courage for your country's good,
May you, like priſtine heroes, tread the plains,
And meet with glory in your long campaigns!
And when the buſ'neſs of the war is o'er,
Crown'd with rich laurels hail your native ſhore!
Fluſh'd with ſucceſs ſeek love's inchanting Charms,
And find a refuge in a *Stella*'s arms!
When winter frowns; when nipping froſts aſſail,
And bind the earth in chains; when ratt'ling hail,
And the ſoft downy flakes of melting ſnow
Drop from the clouds, and into mountains grow;
When tuneful larks are ſeen no more to fly,
Or heard to warble in the morning's ſky;
When ratt'ling thunder ſpreads its anger 'round,
And like loud earthquakes ſhakes the ſolid ground;
When the proud, foaming waves, with bellowing roar,
Fly from their bounds and laſh the ſounding ſhore;
When the tall ſhips are in confuſion toſt,
Daſh'd on the rocks, or in the ſurges loſt;
When from their roots the lofty trees are torn;
And high, in air, their pond'rous branches borne;
When low'ring clouds the glorious ſun o'erſpread,
And all the glitt'ring globes of heaven ſhade;
Stella, e'en then, her blooming charms retains,
And ſhe in winter, as in ſummer, reigns.
No bluſt'ring airs, no pride in her we ſee,
The fair's adorn'd with graceful modeſty.
Born to be lov'd by all, and all to love:
By all to be approv'd, and all approve:
Hence future ages may, with pleaſure, read,
A ſecond *Helen* was in *Goſport* bred.

W. A.

Goſport, Dec. 26,
1754.

COLIN and LUCY. A FRAGMENT.

Dated in the Year 1564, being in or about the ſixth Year of the Reign of Queen Elizabeth.

I.
ON the banks of that cryſtalline ſtream,
Where *Thames*, oft his current delays!
And charms, more than poets can dream;
In his *Richmond*'s bright *villa* ſurveys.

II.
Fair *Lucy*, of all the gay throng
The faireſt, that *Britain* has ſeen!
Now drew ev'ry village along,
From the day ſhe firſt danc'd on the *green.*

III.
Ah! boaſt not of beauty's fond pow'r,
For ſhort is the triumph, ye fair!
Not fleeter the bloom of each flow'r;
And hope is but gilded deſpair.

IV.
His deſire each ſwain, now, behold,
By riches endeavours to prove!
But *Lucy*, ſtill cries, what is gold?
Or wealth, when compar'd to his love?

V.
No, *Colin!* together we'll wield
Our ſickles, in ſummer's bright day;
Together, we'll leaze o'er the field;
And ſmile all our labours, away!

VI.
In winter, I'll winnow the wheat,
As it falls, from your flail, on the ground:
That flail will be muſic, as ſweet,
When your voice, in the labour, is drown'd.

VII.
How oft, wou'd he ſpeak of his bliſs?
How oft, wou'd he call her *his maid?*
And *Colin* wou'd ſeal, with a kiſs,
Ev'ry promiſe, and vow, which he laid.

VIII.
But, hark! o'er the graſs-level land,
The village bells ſound on the plain!
Falſe *Colin*, this morn, gave his hand;
And *Lucy*'s fond tears are in vain!

IX.
Sad *Lucy*, too ſoon, heard the tale;
Too ſoon, the ſad cauſe ſhe was told:
That *his*, was a nympth of the *vale*,
That he broke his fond promiſe, for gold!

X.
As ſhe walkt by the margin, ſo green,
That adorns * * * * * * * * ſide; †
How oft was ſhe, languiſhing, ſeen?
How oft wou'd ſhe gaze on the tide?

XI.
By the clear mirror, then, as ſhe ſate,
That reflected herſelf, and the mead;
A while ſhe bewail'd her ſad fate!
And the green turf, ſtill, pillow'd her head.

XII.
There! there! is it *Lucy* I ſee?——
'Tis *Lucy* the loſt, undone, maid!
Ah! no, 'tis ſome *Lucy*, like me
Some hapleſs, young, virgin betray'd.

---

† In the original (as near as can be gathered) the line is,
"*That adorns* Thames'*s flow'ry ſide.*"

XIII.
Like me, ſhe has ſorrow'd and wept;
Like me! ſhe has fondly believ'd;
Like me, her true promiſe ſhe kept,
And, like me too, is juſtly deceiv'd!
XIV.
I come, dear companion in grief!
Gay ſcenes, and fond pleaſures, adieu!
I come, and we'll gather relief;
From boſoms ſo chaſte and ſo true.
XV.
Like you! I have mourn'd the long night;
And wept out the day, in deſpair!
Like you! I have baniſh'd delight;
And boſom'd a friend in my care.
XVI.
Ye meadows, ſo lovely, * farewel!
Your velvet, ſtill *Colin* ſhall tread:
All deaf to the ſound of that *knell*,
Which tolls for his *Lucy*, when dead!
XVII.
Your wiſh will, too ſure, be obey'd!
Nor *Colin*, her loſs, ſhall bemoan:
Soon, ſoon ſhall poor *Lucy* be laid,
Where her heart ſhall be cold as your own.
XVIII.
Then, claſp'd in the arms of that fair,
Whoſe wealth has been *Lucy*'s ſad fate!
As, together, you breathe the free air,
And a thouſand dear pleaſures relate:
XIX.
If, chance, o'er my turf as you tread,
You dare to affect a fond ſigh!
The primroſe will ſhrink its pale head;
And * * * * * * * * * die. †
XX.
Scarce echo had gather'd the ſound,
But ſhe plung'd from her graſs-ſpringing bed;
The liquid ſtream parts, to the ground;
And the mirror cloſ'd over her head.
XXI.
The ſwains of the village, at eve,
Oft meet at the dark-ſpreading *yew*;
There, wonder how man cou'd deceive!
A boſom ſo chaſte and ſo true.
XXII.
With garlands, of every flow'r,
Which *Lucy*, herſelf, ſhou'd have made!
They raiſe up a ſhort-living bow'r,
And, ſighing! cry, *peace to her ſhade!*
XXIII.
Then, hand lockt in hand, as they move
The green-platting *billoc* around;
They talk of ſad *Lucy*, and love!
And freſhen, with tears, the *fair* ground.
XXIV.
Nay! wiſh they had never been born,
Or, liv'd the ſad moment to view!
When a *Colin* cou'd, thus, be forſworn;
And a *Lucy* cou'd, ſtill, be ſo true!

To the AUTHOR *of the* GENERAL MAGAZINE *of* ARTS *and* SCIENCES.

SIR,

THE following original Cantata was the work of a gentleman now dead; he wrote it, full of grief, for the deceaſe of a young lady, whom he had debauched and left. If you think it worth a place in your Magazine, it is at your ſervice.

I am, your humble ſervant, C. C. A. B. W.

A CANTATA.

RECITATIVE.
'TWas darkneſs — muſky darkneſs, all around,
And night her ſable curtain cloſe had ſpread,
When *Florio* rais'd him from the dew-damp ground,
And ſought the ſacred manſions of the dead.
As o'er his loſt *Maria*'s tomb he hung,
Piercing the night's dull ear, a voice thus ſung.

AIR.
I.
Why thoſe ſighs and tears, fond youth?
Thy *Maria* reſts not here;
Rewarded for her love and truth,
Now ſhe guides yon ſtarry ſphere.
II.
Lo! I clear thy mortal ſight!
Now look up to heav'n, and ſee,
Where ſhe ſits in robes of light,
Nor waſtes a moment's thought on thee.
III.
Yet ſeal'd for falſhood, black as thine,
Trembling hear thy own ſad fate;
Ever ſhalt thou droop and pine,
And ſorrow all thy ſteps ſhall wait.

RECITATIVE.
With horror chill'd the youth aſtoniſh'd ſtands;
"Be this my fate, if ſuch heav'n's will commands."
But ſhall not penitence (he cry'd) atone?
Deſpair ſtrait anſwer'd——death for death alone.

---

* *Or*, lively. *The 2d letter being not viſible.*
† *As near as can be diſcerned, thus:*
"And the violet languiſh and die.

Air.

Ye gay! ye frolick youth, beware;
Nor ruin the too eaſy fair;
Deceive not her who truſts to you;
Leſt *Florio*'s fate ſhould be your *due*.

An Hymn, *occaſioned by the* 65*th* Pſalm.

Let praiſe to thee, all-ſov'reign pow'r, ariſe,
Who fix'd the moutains, and who ſpread the ſkies;
Who o'er thy works extend'ſt paternal care,
Who's kind protection all the nations ſhare:
From the glad climes, whence morn in beauty dreſt,
Forth goes, rejoicing, to the fartheſt weſt;
On thee alone their whole dependence lies,
And thy rich mercy every want ſupplies.
O thou great author of the extended whole!
Revolving ſeaſons praiſe thee as they roll;
By thee ſpring, ſummer, autumn, winter riſe;
Thou giv'ſt the frowning, thou the ſmiling ſkies:
By thy command the ſoft'ning ſhow'r diffuſe,
Till genial warmth the teeming furrow fills;
Then fav'ring ſun-ſhine o'er the clime extends,
And bleſt by thee the verdant blade aſcends;
Next ſpring's gay products cloathe the flow'ry hills,
And joy the wood, and joy the valley fills;
Then ſoon thy bounty plumps the golden ear,
And bids the harveſt crown the fruitful year:
Thus all thy works conſpicuous worſhip raiſe,
And nature's face proclaims her Maker's praiſe.

S. C.

P R O L O G U E, *to the* Fairies.

Written and ſpoken by Mr. Garrick.

Enter—Interrupting the Band of Muſic.

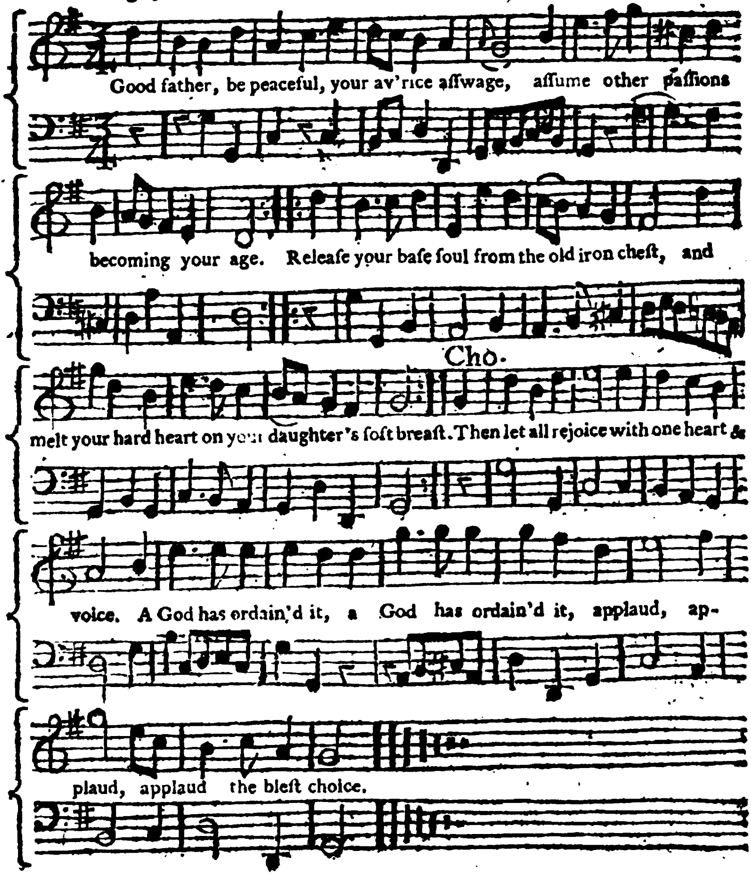
A Moment ſtop your tuneful fingers, pray,
While *here*, as uſual, I my duty pay.
[*To the Audience.*
Don't frown, my friends; [*to the band*] you ſoon ſhall melt again;
But, if not *there* is felt each dying ſtrain,
Poor I ſhall *ſpeak*, and you will *ſcrape* in vain.
To ſee me *now*, you think the ſtrangeſt thing!
For, like friend *Benedick*, I cannot ſing:
Yet in this prologue, cry but you, *Coraggio!*
I'll *ſpeak* you both a *jig*, and an *adagio*.
A *Perſian* king, as *Perſian* tales relate,
Oft' went diſguis'd, to hear the people prate;
So, curious I, ſometimes ſteal forth, *incog*,
To hear what critics croak of me—king Log.
Three nights ago, I heard a *Tête à Tête*
Which fix'd, at once, our *Engliſh Operas* fate:
One was a youth born here, but fluſh from *Rome*;
The *other* born abroad, but here his home;
And firſt the *Engliſh foreigner* began,
Who thus addreſs'd the *foreign Engliſhman*:
An *Engliſh Opera!* 'tis not to be borne;
I, both my country, and their muſic ſcorn:
Oh, damn their *Ally Croakers*, and their *Early-born*.
Signor ſi——bat ſons——wors recitativo:
Il tutto, è beſtiale e cativo!
This ſaid, I made my *exit*, full of terrors!
And now aſk mercy, for the following errors;
Excuſe us firſt, for fooliſhly ſuppoſing
Your *countryman* could pleaſe you in compoſing;
An *Op'ra* too!—play'd by an *Engliſh* band!
Wrote in a language which you underſtand!—
I dare not ſay, *WHO* wrote it—I could tell ye,
To ſoften matters—Signor *Shakeſpearelli*:
This aukward *drama*—(I confeſs th' offence)
Is guilty too, of poetry and ſenſe:
And then the price we take—you'll all abuſe it,
So low, ſo unlike *Op'ras*—but excuſe it,
We'll mend that fault, whenever you ſhall chuſe it.
Our laſt miſchance, and worſe than all the reſt,
Which turns the whole performance to a jeſt,
OUR ſingers all are well, and all will do their beſt.
But why would this raſh fool, this *Engliſhman*,
Attempt an *Op'ra?*—'tis the ſtrangeſt plan!
Struck with the wonders of his maſter's art,
Whoſe *ſacred dramas* ſhake and melt the heart,
Whoſe heav'n-born ſtrains the coldeſt breaſt inſpire,
Whoſe *chorus-thunder* ſets the ſoul on fire!

Inflam'd, aſtoniſh'd! at thoſe magic airs,
When *Sampſon* groans, and frantic *Saul* deſpairs,
The pupil wrote—his work is now before ye,
And waits your ſtamp of infamy, or glory.

Yet, ere his errors and his faults are known,
He ſays, thoſe faults, thoſe errors are his own;
If thro' the clouds appear ſome glimm'ring rays,
They're ſparks he caught from his great maſter's blaze.

A SONG.

Sung by Mr. Beard *in* Proteus, *or* Harlequin in China.


Good father, be peaceful, your av'rice aſſwage, aſſume other paſſions
becoming your age. Releaſe your baſe ſoul from the old iron cheſt, and
Cho.
melt your hard heart on your daughter's ſoft breaſt. Then let all rejoice with one heart &
voice. A God has ordain'd it, a God has ordain'd it, applaud, ap-
plaud, applaud the bleſt choice.

II.

Do you, my young bridegroom, keep ſacred thoſe bands;
Let your heart ever anſwer the union of hands:
Be you prompt to learn, never forward to teach;
Be profuſe of your ſmiles, but be ſparing of ſpeech.

III.

And now, brother *Proteus*, one lecture for you;
To *Britain* return, bid to *China* adieu:
Chineſe and *Groteſque* ſo engroſſes high life,
Some lady'll buy you, and ſome lord take your wife.

Several pieces of poetry are come to hand; which for want of room we muſt defer.—Crito's *paraphraſe will be in our next. We return thanks to the ingenious authors, of the many encomiums on this work: and ſhall do our utmoſt, to preſerve their good opinion; but muſt beg their excuſe for not inſerting them in our* Magazine: *as we apprehend ſuch a meaſure, would favour too much of vanity.*

N. B. *We have not inſerted the account of a new-invented clock from* North Curry, *as it is propoſed thereby to ſhew a* perpetual *and* equable motion; *the firſt of which is* demonſtrably impoſſible, *and the other quite* impracticable, *in the nature of things; it being our ſettled purpoſe, never to amuſe our readers with any thing in the mathematical or mechanical way, but what may afford them a rational ſpeculation, or be of ſome real uſe in buſineſs.*

☞ *Our correſpondents are deſired for the future, to direct all their letters, that contain any thing relative to this* General Magazine, *for Mr.* Owen *(only) at* Temple-Bar.

A CHRONOLOGICAL MEMOIR *of* Occurrences.

For *FEBRUARY*, 1755

FOREIGN AFFAIRS.

Ruſſia.

AN edict was publiſhed for preventing an ordonnance of the 29th of November laſt, relating to the exportation of Ruſſian merchandize being put into execution; her imperial majeſty declaring, that the ordonnances relating thereto, ſhall remain on their antient footing.

Sweden. The king cauſed an advertiſement to be publiſhed, offering a large reward to ſuch perſons as ſhall diſcover the author or authors of counterfeit bank notes, or bills of exchange: and a chapter of the order of the ſword has been held, when his majeſty created ſeveral new knights of that order. It is alſo affirmed here, that the conferences for the regulation of the limits in Finland, will be renewed at Abo, in April next, when that intricate affair will be ſettled to the advantage of both parties.

Denmark. —That the queen continues in perfect health, and they are in daily expectation of her delivery—That a camp will be formed next ſummer, and orders are iſſued for furniſhing the neceſſary magazines for that purpoſe.

Poland. The king has cauſed an order to be ſent into the ſeveral Palatinates of Poland, bordering upon Ruſſia, forbidding all his officers in thoſe parts, to receive any deſerters from the Ruſſian troops. That the Palatine of Novogrod, died at Grodno; and that the Palatine of Podlachia, died at his country ſeat.

Germany. Several courriers arrived from foreign courts, on which have been held divers councils in the preſence of their imperial majeſties—and that a great number of workmen were ſent from thence to Hungary, to be employed in repairing the fortifications of that kingdom.—The weather here continues ſo very ſevere, that notwithſtanding the centinels are ordered to be relieved every half hour, two of them have died with cold.

Italy. The differences which have for a long time ſubſiſted between the court of Naples and the order of Malta, are at length amicably adjuſted.—Mount Veſuvius continues to throw out great quantities of fire, which runs off in torrents, as mentioned in our laſt.

France. We are informed, that the king has ordered a Lettre de Cachet, to be diſpatched to the archbiſhop of Aix, commanding him to repair to a certain little town in his dioceſe, there to remain in exile: his majeſty, at the ſame time, ſent orders to the parliament of Province, to diſcontinue any further proceedings againſt that prelate.

United Provinces. The marquis de Grimaldi, ambaſſador from Spain to this court, is ſhortly expected. The ſtates of this province ſeparated, after having agreed to raiſe the ſame public taxes as were collected laſt year.

Algiers Dec. 11. The Dey was aſſaſſinated in his palace, and the grand treaſurer mortally wounded, by 6 ſoldiers, while they were paying them in the court-yard. They were at laſt cut to pieces; though things hung in the balance for above half an hour. The treaſurer is ſince dead of his wounds. One of the rebels, after taking the Dey's hand to kiſs, drew a concealed dagger, and run it into his breaſt, ſoon after which, he dropped. At the ſame time another attacked the treaſurer. The firſt

cenconſpirator, when the Dey fell, took off his turbant, put it on his own head, and placed himſelf in his ſeat, and, imagining he ſhould be acknowledged Dey, began to harangue the Divan. He then ordered the band of muſic to play, and the drums to beat. He had thus ſat unmoleſted above a quarter of an hour, and had he continued in the ſame ſituation a quarter of an hour longer, he would have been declared ſovereign: but one of the Chiauſes, or meſſengers of the palace, taking courage, ſnatched up a carbine, and ſhot him dead: this example encourged the other Chiauſes, and his five accomplices were ſoon diſpatched.

Ali Baſhaw, the Aga of the Spahis, or Generaliſſimo, was immediately ſent for, and placed in the ſeat of the murdered Dey: the cannon were fired, and, in one hour's time, from the moſt diſturbed ſituation imaginable, perfect tranquility was reſtored to the city.

The preſent Dey is a hearty robuſt man, aged 46; the late Dey was 75 years old, and in the 6th year of his reign—The conſpirator who killed the Dey had been baſtinadoed laſt year by his order; the reſt were all ſoldiers, one of them ſpun linen, and another was a cobler.

LONDON.

Jan. 27. ON his majeſty's proclamation, promiſing a bounty of 30s. to every able ſeaman, who would voluntarily enter on board the royal navy, 200 Greenwich-penſioners offered themſelves, and were accepted. The ſame day orders were ſent to the keeper of Newgate, to diſcharge the ſmugglers, and priſoners for ſmall debts, on condition of their ſerving on board the king's ſhips.

28. The buildings of captain Huddy's rope-walk at Stepney cauſeway, took fire, and the flames communicating to another building, both were conſumed, with great quantities of pitch, tar, ſpun-yarn and cordage.

30. The watermen's company appointed 500 men to ſerve on board the fleet now fitting out.

31. Col. Dunbar's, and Sir Peter Holket's regiments ſailed from Ireland for Virginia, in 16 tranſports, under convoy of two men of war.

Feb. 5. The Ruſſian ambaſſador gave a moſt magnificent ball at Somerſet-houſe, at which his majeſty and the royal family were preſent. They firſt paid a viſit to the ducheſs of Norfolk, in St. James's ſquare, where a portico covered with canvas was erected from the door to the foot-way, for the chairs to ſet down the ladies under cover. From thence they proceeded to Somerſet-houſe, in chairs, continuing for a conſiderable time without intermiſſion. It would take up too much room to diſplay the grandeur of the entertainment, or the brilliancy of the illuſtrious aſſembly, who vied with each other in richneſs of attire. Few exhibitions of this kind have equalled, none excelled it. The number of perſons was about 1400. All the company, except his majeſty, unmaſked at 9 o'clock.

7. The ſcaffolding, in Weſtminſter-abbey, was taken down from before a mauſoleum, erected to the memory of the brave captain Cornwall, commander of his majeſty's ſhip the Marlborough, who, fighting for his country, glorioſly fell in the naval engagement off Toulon, between the Britiſh fleet under admiral Matthews, and the combined fleets of France and Spain. February 11, 1744, O. S.

Quis deſiderio ſit pudor, aut modus
Tam chari capitis? Hor.

This monument, which is near 36 feet high, has a bold baſe and pyramid, of rich Sicilian jaſper. Againſt the pyramid is a rock, (embelliſhed with naval trophies, ſea weeds, &c.) in which are two cavities. In one a Latin epitaph is read. In the other cavity, is a view of the ſea-fight abovementioned, in baſſo relievo; on the foreground whereof the Marlborough, (of 90 guns) is ſeen fiercely engaged with admiral Navarro's ſhip, (the Real, of 114 guns) and her two ſeconds; all raking the Marlborough fore and aft. On the rock ſtand two figures. The one repreſents Britannia, under the character of Minerva, accompanied with a lion. The other figure is expreſſive of fame, who, having preſented to Britannia a Medallion of the hero, ſupports it, whilſt exhibited to public view. The Medallion is accompanied with a Globe, and various honorary crowns, as due to valour. Behind the figures is a lofty, ſpreading palm-tree, (whereon is fixed the hero's ſhield or coat of arms) together with a laurel-tree; both which iſſue from the naturally barren rock; as alluding to ſome heroic and uncommon event.—This monument, deſigned, and executed by Mr. Taylor, and erected by order of his majeſty, upon the unanimous vote of the houſe of commons, is an illuſtrious inſtance of national gratitude, as well as of good policy; in being devoted to the memory of a greatly diſtinguiſhed naval officer; our navy being the well-known palladium of the Britiſh empire, and of its extenſive commerce. And ſhews (with other monuments ſet up in this abbey) the vaſt improvement made here, of late years in ſculpture; which, with her ſiſter arts, is making haſty advances towards perfection in this kingdom.

On Capt. JAMES CORNWALL,

THO' Britain's genius hung her drooping head,
And mourn'd her antient naval glory fled;
On that fam'd day, when France, combin'd with Spain,
Strove for the wide dominion of the main:
Yet, Cornwall! all with general voice agree
To pay the tribute of applauſe to thee.
When his bold chief, in thickeſt fight engag'd,
Unequal war with Spain's proud leader wag'd;
With indignation mov'd, he timely came,
To reſcue from reproach his country's name:
Succeſs too dearly did his valour crown;
He ſav'd his leader's life, but loſt his own.
Theſe fun'ral rites a grateful nation pays,
That lateſt times may learn the Hero's praiſe:
And chiefs, like him, ſhall unrepining lead,
When ſenates thus reward the glorious deed.

Circuits appointed for the Lent Aſſizes.

OXFORD CIRCUIT.

Mr. Juſtice Birch, Mr. Baron Adams.
Berks, Monday, March 3, at Reading.
Oxford, Wedneſday 5, at Oxford.
Worceſterſhire, Saturday 8, Worceſter.
City of Worceſt. ſame day, at the ſaid city.
Staffordſhire, Thurſday 13, at Stafford.
Shropſhire, Monday 17, at Shrewſbury.
Herefordſhire, Saturday 22, at Hereford.
Monmouth, Thurſday 27, at Monmouth.
Glouceſterſhire, Saturday 29, at Glouceſter.
City of Glouceſter, the ſame day, at the ſaid City.

MIDLAND CIRCUIT.

Lord Chief Baron Parker, Mr. Baron Smythe.
Northamptonſhire, Tueſday March 4, at Northampton.
Rutland, Friday 7, at Oakham.
Lincolnſhire, Monday 10, at the Caſtle of Lincoln.
City of Lincoln, the ſame Day and Place.
Nottinghamſh. Friday 14, at Nottingham.
Town of Nottingham, Saturday 15, at the Town.
Derbyſhire, Tueſday 18, at Derby.
Leiceſterſhire, Friday 21, at the Caſtle of Leiceſter.
Borough of Leiceſter, Saturday 22, at the Borough.
City of Coventry, Tueſday 25, at the City.
Warwickſhire, Wedneſday 26, at Warwick.

NORTHERN CIRCUIT.

Lord Chief Juſtice Ryder, Mr. Juſtice Clive.
Lancaſhire, Saturday March 8, at the Caſtle of Lancaſter.
City of York, Monday 17, at the Guildhall.
Yorkſh. the ſame day, at the caſtle of York.

NORFOLK CIRCUIT.

Ld. Chief Juſtice Willes, Mr. Juſtice Foſter.
Bucks, Monday March 10, at Ayleſbury.
Bedfordſhire, Thurſday 13, at Bedford.
Huntingdonſh. Saturday 15, at Huntingdon.
Cambridgſhire, Tueſday 18, at Cambridge.
Norfolk, Friday 21, at Thetford.
Suffolk, Tueſday 25, at Bury St. Edmunds.

WESTERN CIRCUIT.

Hon. Mr. Baron Legge, Mr. Juſtice Bathurſt.
Southampton, Tueſday March 4, at the caſtle of Wincheſter.
Wilts, Saturday 8, at New Sarum.
Dorſet, Thurſday 13, at Dorcheſter.
City and County of Exeter, Monday 17, at the Guildhall.
Devon, ſame day, at the caſtle of Exeter.
Cornwall, Tueſday 24, at Launceſton,
Somerſet, Monday 21, at the caſtle of Taunton.

HOME CIRCUIT.

Mr. Juſtice Deniſon, Mr. Juſtice Willmot.
Hertford, Thurſday, March 6, at Hertford.
Eſſex, March 10, at Chelmsford.
Kent, Monday 17, at Rocheſter.
Suſſex, Monday 24, at Eaſt-Grinſtead,
Surry, Monday 31, at Kingſton on Thames.

NORTH WALES CIRCUIT.

Hon. Chief Juſtice William Noel, Hon. John Talbot.
Montgomeryſhire, Wedneſday March 19, at Pool.
Denbighſhire, Tueſday 25, at Ruthin,
Flintſhire, Monday 31, at Flint.
Cheſhire, April 5, at the caſtle of Cheſter.

SOUTH WALES CIRCUIT.

Hon. John Williams, John Hervey, Eſqrs.
Cardiffe, Thurſday, March 27.
Brecon, Wedneſday April 2.
Preſteign, Tueſday 8.

Sheriffs appointed by his majeſty in council for the year 1755.

Berkſhire, Sir Mark Stuart Pleydell, of Coleſhill, Bart.
Bedfordſhire, Tho. Vaux, of Whipſnade.
Buckinghamſhire, Henry Uthwaite, of Lathbury.
Cumberland, Tim. Fetherſtonhaugh, of Kirk Oſwald.
Cheſhire, Tho. Slaughter, of Newton.
Camb' and Hunt' William Mitchell, of Hemingford.

Cornwall, Francis Beachamp, of Gwennop.
Devonſhire, Sir J. Rogers, of Plymſtock, Bt.
Dorſetſhire, Tho. Strode, of Bemiſter.
Derbyſhire, Philip Gell, of Hopton,
Eſſex, Rd. Chiſwell, of Debden.
Glouceſterſhire, Ja. Lamb, of Fairford.
Hertfordſhire, G. T. Heyſham, of Paul's Walden.
Herefordſhire, Tho. Penoyre, of Clifford.
Kent, George Sayer, of Charing.
Leiceſterſh. Sir J. D'nvers, of Swithland, Bt.
Lincolnſhire, W. Marſhall, of Theddlethorpe.
Monmouthſhire, J. Jones, of Craigwith.
Northumberland, J. Swinburn, of Weſtgate.
Northamptonſhire, H. White, of Woodend.
Norfolk, Miles Branthwayte, of Attlebridge.
Nottinghamſhire, Sir Tho. Parkyns, of Bunny, Bart.
Oxfordſhire, Sir W. Burnaby, of Broughton, Knt.
Rutlandſhire, J. Maydwell, of Barr Gates in Oakham.
Shropſhire, Fra. Turner Blythe, of Shrewſbury.
Somerſetſhire, Roger Lyde, of Chellwood.
Staffordſhire, J. Burriſh Leigh, of Ruſhall.
Suffolk, Cooke Freſton, of Mendham.
Southampton, John Barnard, of Alresford.
Surry, John Mackerill, of Bermondſey.
Suſſex, John Major, of Eaſt Grinſted.
Warwickſhire, W. Willington, of Hurley.
Worceſterſhire, Fra. Highway, of Chadley.
Wiltſhire, Arthur Evans, of the Cloſe of New Sarum.
Yorkſhire, Tho. Foljambe, of Aldwarcke.

SOUTH WALES.

Brecon, Tho. Price, of Talgarth.
Carmarthen, Rees Price, of Carmarthen.
Cardigan, W. Bowen, of Troedyroyr.
Glamorgan, Thomas Popkins.
Pembroke, John Hook, of Bangeſton.
Radnor, W. Goſſe, of Preſteign.

NORTH WALES.

Angleſey, Hugh Davies, of Brynharddyn.
Carnarvon, Rd. Lloyd, of Tan y bryn.
Denbigh, Watkin Wynne, of Voylas.
Flint, John Barker, of Overton.
Merioneth, Wm. Humphreys, of Maerdu.
Montgomery, Jenkin Lloyd, of Cloch faen.

SOUTH WALES.

J. Pollen, Eſq; and Ed. Poore, Eſq; juſtices.
Carmarthen, Saturday, March 29.
Haverfordweſt, Friday, April 4.
Cardigan, Thurſday, April 10.

Feb. 8. A proclamation was publiſhed in the Gazettee for recalling, and prohibiting, ſeamen from ſerving foreign princes and ſtates: and for the increaſing the bounty money, to all able-bodied ſeamen to 3l. alſo offering a reward of 2l. to be paid to any perſon who ſhould diſcover any ſuch, who ſecrete themſelves; and 30s. for every ordinary ſeaman.

9. The ſhips commiſſioned at Rocheſter, and their commanders, are as follow, viz.

Guns 90, Prince, Capt. Saunders, fitting, as it is ſaid, for Lord Anſon.
74, Torbay, Capt. Colby, fitting for admiral Boſcawen.
90, Barfleur, Lord Harry Poulet,
70, Yarmouth, Capt. Norris.
70, Naſſau, Capt. Cockburne.
60, Dunkirk, Capt. Howe.
60, Litchfield, Capt. Stevens.
70, Culloden, Capt. Ward, at the Nore.

Seven more, chiefly of the line, are getting ready for the ſea.

The number and claſs of ſhips, fitting out at Portſmouth, are,

Guns.	Nº.	Guns.	Nº.	Guns.	Nº.
90	2	60	2	20	1
80	1	50	2	Sloop	1
74	7	40	2		

12. A general court was held of the governors of St. Luke's hoſpital for lunaticks, when Sir William Beauchamp Proctor, Bart. was choſen one of the vice-preſidents, in the room of Sir James Lowther, deceaſed; and they ordered 10 more cells to be appropriated to the uſe of incurables. The committee, among other things, reported, that the ſtock ſtanding in Eaſt India annuities, for the uſe of this charity, amounted to 10,000l. And ſince the firſt of February, 1754, the following legacies have been left for the ſupport of it.

	l.	s.	d.
By Sir Hen. Marſhall	200	0	0
Mrs. Heſter Fuller, for incurables only	500	0	0
Joſ. Fawthorp, Eſq;	50	0	0
Mr. Rob. Thatcher	50	0	0
Mrs. Eliz. Hill	30	0	0
Mr. Rd. Worth	100	0	0
Mrs. Eliz. Schaffer	100	0	0
Sir James Lowther, Bart.	100	0	0
Lewin Cholmley, Eſq;	50	0	0
William Stratton, Eſq;	200	0	0
Total	1375	0	0

About four o'clock, in the morning, was ſeen to drop from the ſtars, by two gentlemen, in the pariſh of Medmenham, near Great Marlow in Buckinghamſhire, a ſurprizing meteor of a fierce, fiery ſubſtance: it fell in a direct perpendicular on a ſteep hill, about 500 yards diſtance from where they ſtood. It appeared when it came out of the horizon, ſomewhat larger than the ſhooting of a ſtar, and increaſed its magnitude when it fell, to near three feet in diameter; and left behind it ſeveral ſparkles as it came down. When the fire came near the earth, the light appeared as bright as at noon-day, and left a ſuffocating and ſulphurous ſmell.

15. The Hon. E. India Company have received advice, by Capt. Kent, commander of the Dragon, from Coaſt and Bay, and laſt from Madagaſcar, at which place Commodore Watſon was ſafely arrived with the men of war and tranſports under his command, in good condition; where he landed his men for refreſhment, purpoſing ſoon to ſail for India.

20. The Right. Hon. the Earl of Hertford ſet out for Paris, in quality of ambaſſador from his Majeſty.

The E. India company ſhipped warlike ſtores to the amount of 24,000 l. for their ſettlements.

A Regiſter *of* THEATRICAL ENTERTAINMENTS.

	Drury-Lane.	Covent-Garden.
Jan. 23.	*The Way of the World.—Proteus.*	*Venice preſerved.—Scapin.*
24.	*Much ado about nothing.—Proteus.*	*Othello.—Harlequin Skeleton.*
25.	*The Mourning Bride.—Chaplet.*	*The Nonjuror.—Scapin.*
27.	*The Mourning Bride.—Anatomiſt.*	*Coriolanus.—Harlequin Skeleton.*
28.	*The Buſy body.—Proteus.*	*Julius Cæſar.—Virgin Unmaſked.*
29.	*The Mourning Bride.—Lethe.*	*The Twin Rivals.—Orpheus.*
31.	*Every Man in his Humour.—Devil to pay.*	*The Inconſtant.—Orpheus.*
Feb. 1.	*Barbaroſſa.*	*The Miſer.—Orpheus.*
3.	An *Engliſh Opera.*	*The Recruiting Officer.—Orpheus.*
4.	*Barbaroſſa.*	*The Diſtreſſed Mother.—Orpheus.*
5.	*Twelfth Night.*	*The Suſpicious Huſband.—Orpheus.*
6.	An *Engliſh Opera.*	*The Committee.—Orpheus.*
7.	*Romeo and Juliet.*	*Cato.—Orpheus.*
8.	*Provoked Wife.—Proteus.*	*Love for Love.—Orpheus.*
10.	*The Faries.*	*The Kind Impoſtor.—Orpheus.*
11.	*Barbaroſſa.*	
13.	*The Faries.*	*The Way of the World.—Orpheus.*
15.	*Barbaroſſa.*	*Love for Love.—Orpheus.*
17.	*The Faries.*	*The Provoked Huſband.—Orpheus.*
18.	*As you like it.—Proteus.*	*King Henry the Fifth.*

BIRTHS.

Feb. 8. Her grace the ducheſs of Montroſs, delivered of a ſon and heir.

9. The right hon. lady Athenry, of a ſon and heir, at Townly-hall, Ireland.

The great Princeſs of Ruſſia, of a young Prince.

18. Her grace the ducheſs of Hamilton, of a ſon and heir, at Edinburgh.

MARRIAGES.

Jan. 16. Mr. Peter Gauſſen, jun. to miſs Boſanquet, daughter of Sam. Boſanquet, Eſq; of Epping Foreſt.

17. G. Dixon, merchant, Lombard-ſtreet, to miſs Ann Carlton of Mitcham.

25. Thomas Parker, Inner Temple, Eſq; to miſs Watkins, of Hackney.

Feb. 4. Alexander Power, Eſq; to miſs Willis, daughter of the biſhop of Bath and Wells.

5. Francis Beckford, Eſq; of Catley, Cambridgeſhire, to miſs Suſanna Love, of Bedford-row.

6. The rev. Dr. Allen, ſub-dean of his majeſty's chapel, to miſs Grainger of Saliſbury-court, Fleetſtreet.

T. C. Tracy, eldeſt ſon to the right hon. lord viſcount Tracy, to miſs Harriot Bathurſt, daughter of the hon. Selina Bathurſt.

Edmund Wallis, Eſq; to miſs Sarah Hawkins, of Weſt-Ham.

7. Adam Drummond, Eſq; to the right hon. lady Cath. Aſhe.

10. Wm. Bowen, Eſq; of St. James's, to miſs Morgan, of Cavendiſh-ſquare.

11. Fran. Eyre, Eſq; of Wakewood, Oxfordſhire, to the right hon. lady Mary Ratcliff, the preſent counteſs of Newburgh in Scotland.

The rev. Mr. Romaine, lect. of St. Dunſtan's in the Weſt, to miſs Price, of Shoreditch.

13. Adam Jellicoe, of the pay-office, to miſs Chitty, of Ironmonger-lane.

18. Capt. Berragon, of gen. Wolfe's regiment, to miſs Taſſel.

22. The rev. Mr. John Trye, rector of Leekhampton, Glouceſterſhire, to miſs Molly Longford.

DEATHS.

Jan. 15. The right hon. counteſs of Antrim.

Feb. 2. Charles Mainwaring of the South-ſea-houſe.

Arthur Stert, Eſq; at Memland near Plymouth, who repreſented the ſaid Borough, from the firſt parliament of his preſent majeſty, till the laſt general election.

3. Edmund Burt, Eſq; late agent of general Wade's regiment, and the author of a deſcription of Scotland.

21. Her grace the ducheſs of Mancheſter.

Civil and Military Preferments.

Whitehall, Jan. 4. HIS Majeſty has been pleaſed to grant to Matthew Lamb, of Brokers Hall, Hertfordſh. the dignity of a baronet of Great Britain.

Stephen-Martin Leake, Eſq; to be Garter king at arms, in the room of John Anſtice, *deceaſed.*

Charles Townley, Eſq; to be Clarencieux king at arms,

Jan. 7. The king was pleaſed to appoint Charles Duke of Marlborough to be Keeper of the Privy Seal, in the room of E. Gower deceaſed.

Granville, now Earl Gower, to be Lieut. and Cuſtos Rotulorum of Staffordſh. in the room of his father.

9. The D. of Bolton, and the Earl of Egmont ſworn of the Privy council.

14. The D. of Rutland appointed ſteward of the houſhold, in the room of the D. of Marlborough, now keeper of the Privy ſeal.

18. The King was pleaſed to appoint John Douglaſs, Eſq; to be captain of a troop in the Royal regiment of North Britiſh dragoons, commanded by lieut. gen. J. Campbell, Francis Lindſey to be capt. lieutenant, James Dalrymple, gent. to be lieut. and Baſil Heron to be cornet in the ſame.

William Egerton, gent. to be ſub-br. and cornet to the ſecond troop of horſe guards.

23. William Littleton, Eſq; capt. general and governor of S. Carolina, in the room of ——Glenn, Eſq; recalled.

Ld Monfort appointed high ſteward of Cambridge, in the room of his father dec.

28. The Rt. Hon. Robert Dundaſs, advocate for Scotland.

Henry St. John, Eſq; to be enſign in the Cold-ſtream regiment of guards.

Dr. Blair elected a fellow of the Royal ſociety.

Febr. 2. The Rt. Hon. Ld Anſon, firſt Ld of the admiralty, was choſen a governor of the Charter-houſe, in the room of Ld Gower deceaſed.

The ſame day his Majeſty was pleaſed to appoint the Hon. Colonel Waldgrave to the command of the regiment of dragoons on the Iriſh eſtabliſhment.

Sir Martin Wright, one of the Judges of the court of King's Bench, reſigned, on account of his age; and Sir J. Hardſley Willmot was appointed a judge of that court in his room.

3. The Lords of the Admiralty appointed capt. Cha. Colby commander of the Torbay of 80 guns.

J. Williams, Eſq; Attorney gen. of Cheſter, is made a Welch judge, in the room of Rich. Carter, Eſq; deceaſed; and Hen. Hall Eſq; is appointed Attorney gen. of Cheſter, in the room of judge Williams.

5. Charles Hardy, Eſq; appointed governor of New York, vacant by the death of Sir Danvers Oſborn, Bt.

6. At the Grand council held at St. James's his Majeſty was pleaſed to appoint Henry Oſborn, Eſq; to be vice admiral of the red; Tho. Griffen, Eſq; and Sir Edw. Hawke to be vice admirals of the white; Ch. Knowles, Eſq; Hon. J. Forbes, and the Hon. Edward Boſcawen, to be vice admirals of the blue. Charles Watſon, Eſq; and Temple Weſt, Eſq; to be rear-admirals of the red. George Pococke, Eſq; and the Hon. Charles Townſhend, to be rear-adm. of the white; and Savage Moſtyn, Eſq; rear-adm, of the blue.

11. Sir Eardly Wilmot, Kt. Mr. Hewit, and Mr. Martin, were called to the degree of ſergeants in Weſtminſter-hall.

Richard Tyrrel, Eſq; appointed commander of the Ipſwich, 70 guns.

12. Sackville Fox, Eſq; genealogiſt of the moſt noble order of the Bath.

14. The King was pleaſed to appoint the Rt. Hon. Ld Ducie, of Moreton, to be his lieutenant, cuſtos rotulorum, and vice admiral of the county of Glouceſter; alſo conſtable of the caſtle of St. Briavells, and keeper of the deer and woods in the foreſt of Dean in the ſaid county.

15. Edw. Winnington, of Stanford-court, Worceſterſhire, Charles Sheffield, of Normandy, Lincolnſh. and Horatio Mann, reſident at the court of Florence, were created baronets of Great Britain.

Edward Falkingham, Eſq; comptroller of the navy, in the room of admiral Moſtyn.

Thomas Cooper, Eſq; commiſſioner of the victualling office, in the room of captain Falkingham.

ECCLESIASTICAL PREFERMENTS.

Jan. 1. Revd. Jonathan Shipley, A. M. preſented to the Rectory of Deer, Suſſex, 120 l. per Ann.

Fred. Comer, B. A. to the Rectory of Hebdon, Wiltſh.

Mr. Herwood, to Weſton, Northamptonſhire.

Samuel Cuſhing, A. M. to the vicarage of Lympsfield, Dorſet, 120 l. per ann.

T. Fownes, A.M. to the vicarage of Brixome, Devonſh.

Mr. Adamſon, to Creſtwich and Soley rectories, Norfolk.

George Ch. Bleek, A. M. to the vicarage of Berkey, Glouceſterſhire.

Thomas Longman, B. L. to the Rectory of St. Mary in the Vale, near Totneſs, Devonſhire.

Charles Baker, A. M. to the Rectory of Hembury St. Michael, Wiltſh. 170l. per an.

Samuel Leach, B. A. to the Rectory of Coombe Leigh, Surry.

Dan. Bradbury, A. M. to the vicarage of Long Martick, Northamptonſh. 140l. per an.

John Brigham, B. D. to the vicarage of Strandground and Fawcet, Northamptonſh. 230 l. per ann.

Mr. Dixon elected lecturer of St. Dionis Back-church, Fanchurch-ſtreet.

Mr. Lawrence, miniſter of St. Mary's Aldermanbury, in the room of Mr. Sanford deceaſed.

Mr. Stanſby, lecturer of St. Mary le Strand.

J. Skelton, to the vicarage of Gornhill, Lincolnſhire.

John Bewton, M. A. to the vicarage of Melkſham, Wiltſh. 300 l. per ann.

The Rev. Henry Skey, to the rectory of Cranford, Middleſex.

Jacob Millar, B. A. to the rectory of Milford on the Rye, Monmouthſh. 115 l. per an.

Charles Lucas, B. A. to the vicarage of Leſney, Gloſterſh.

The Rev. William Smythe, to the rectory of Thoydon, Eſſex.

Samuel Strickland, B. L. to the vicarage of Barton Blean, Northamptonſh.

Thomas Langford, B. A. to the rectory of Melcomb St. Andrews, Suſſex.

Daniel Downe, A. B. to the living of St. Martin's Stamford Baron.

Alex. Richardſon, to the rectory of Symſtone, Bucks, 200 l. per ann.

The Rev. M. Ja. Daville to the vicarage of Iſſington St. Mary, and Wiggenhall St. Mary, Norfolk.

The Rev. Mr. Barker, to the rectory of Culmington Shropſh. 150 l. per an.

DISPENSATIONS *to hold two livings.*

John Vade, A. M. the vicarage of Croydon, Surrey, with that of St. Nicholas, Kent, 350 l. per ann.

Richard Jones, A. M. the rectory of Luddington, with the vicarage of Wheatley, Northamptonſh.

Thomas Slater, A. M. the rectory of Salford, with the vicarage of Kenſham, Somerſ.

Henry Jones, A. M. the rectory of Crawley, with the chapel of Hunton, Hampſhire.

Andrew Edwards, A. M. the rectory of Aber, Carnarvonſh. with the rectory of Dolgelly, Merionethſh.

The Rev. William Smith, B. L. to the rectory of Stapleford-Tawney, Exon; and the rectory of Thyden Mount, in the ſame county.

B——KR——TS.

Thomas Jetherell, of Huntingdon, corn mer.
Thomas Barrett, of Brecon mercer.
William Harveſt, of Kingſton upon Thames, brewer.
John Temple, of Yarm in Yorkſhire, linnen draper.
John M'William, and Alexander Shidden, of Briſtol, merchants and partners.
John Boover, of Wiltſhire-lane, E. Smithfield, London, brewer.
William Searle Peers, of Braintree, Eſſex, clothier.
Robert Howill, of Bell-alley, Coleman-ſtreet, London, taylor.
Joſeph Rumpe, of Buxton in Norfolk, miller.
Henry Lindſey, of Seven Oakes in Kent, Shopkeeper.
John and James Gatward, of Cambridge, coal merchant.
William Wilſon and William Deverty, of Spittle-fields, ſcarlet-dyers.
Thomas King, of Great Yarmouth, baker.
Amos Boult, of Arundel, Suſſex, ſhipwright.
Joſeph Fowden, of Wormley, Hertfordſh. cyder merchant and maltſter.
Chriſtopher Myers, of Whitehaven, merch.
George Lang the Younger, of Southzeal, Devon, ironmonger.
Peter Nicholſon, of Ulverſtone, Lancaſhire, merchant.
John Oſtler, of Kingſton upon Hull, carrier.
James Freſhfield, of St. Giles's in the fields, hoſier and chapman.
Edward King, of High Wycomb, Bucks, paper-maker.
Samuel Weſt, of St. Leonard, Shoreditch, dyer.

BILL *of Mortality from* Jan. 21 *to* Feb. 18.

Buried			Chriſtened		
Males	982	2027	Males	647	1275
Females	1045		Females	628	
Under 2 years old	620				
Between 2 and 5	160		Buried,		
5 and 10 —	64		Within the walls	198	
10 and 20 —	50		Without	498	
20 and 30 —	169		*Mid.* and *Surry*	880	
30 and 40 —	9		City & Sub. *Weſt.*	451	
40 and 50 —	224				
50 and 60 —	208			2027	
60 and 70 —	154				
70 and 80 —	106		Weekly *Jan.* 28.	495	
80 and 90 —	65		*Feb.* 4.	501	
90 and 100 —	7		11.	508	
100 and 109 —	1		18.	523	
	2027			2027	

BOOKS

BOOKS, *publiſhed in February.* 1755.

ACcount of an attempt to aſcertain the longitude. 1s. *Bouquet.*

Bates's reply to Dr. Sharpe's review and defence. 2s. *Withers.*

Brown's tranſlation of Juſtin Martyr's dialogue with Tycho the jew. 11s. *Rivington.*

Cambridge-Phædrus. 1s. 6d. *Dodd.*

Cobden's eſſay, tending to promote religion. 1s. *Baldwin.*

Colin and Lucy, a Fragment. (See page 24 in our poetry.) 6d *Owen.*

Diſſertation (hiſtorical) on the books of the New Teſtament. 5s. *Millar.*

Dodſon's mathematical repoſitory. Part III. 4s. *Nourſe.*

Duck (the rev.) his poem, entitled Cæſar's Camp. 1s. *Dodſley.*

Enquiry after new lights. 3d *Lewis.*

Eſſay towards an anſwer to the anſwer on Spirit. 3s. *Payne.*

Eſſay on the medicinal education of children. 5s. *Field.*

Eſſay on a ſleeping Cupid. 1s. *Manby.*

Eſſay on the courſes purſued by Great Britain in the affairs of her colonies. 1s. 6d. *Baldwin.*

Edwards's tranſlation of the pſalms. *Dod.*

Fairies, an opera. (See the prologue, in our poetry, page 26.) 1s. *Tonſon* and *Draper.*

Free Thoughts and Bold Truths. 6d. *Cooper.*

Greenhill's Eſſays on the prophecies of the New Teſtament. 1s. 6d. *Crowder.*

Hiſtory of Polly Willis, 3s *Reeve.*

——— of a lady's ſlippers 1s. *Cooper.*

Harvey's Theron and Aſpaſio. 8vo. 18s. 12mo. 9s. *Rivington.*

Jennings (D. D.) his two diſcourſes on the truth of the ſcriptures. 1s. *Buckland.*

Imperial Ruſſian miſcellany. 1s. *Cooper.*

Inveſtigator (the) No. cccxxii. 1s. 6d. *Millar.*

King (Dr.) his apology. 1s. *Owen.*

Letter to Mr. Strainger, not wrote by Mr. Hanway.

——— from a miniſter of the Moravians to the author of the Moravians compared. 6d. *Robinſon.*

——— on the ſtudy of the Hebrew ſcriptures. 1s. *Withers.*

——— to the rev. Mr. Thomas Jones. 6d. *Collier.*

Ligature preferable to Agaric, 6d. *Griffiths,*

Liſt of the Lent preachers. 1d. ½ *E. Owen.*

Macklin's anſwer to *Tully.* 6d. *Davey* and *Low.*

Magens's Eſſay on inſurances. 2 vols. 4to. 1l. 7s. *Baker.*

Martin (Mr. Benj.) The wonders of the cometary world diſplay'd. A fine large copper plate. 2s. 6d. *Owen.*

Muſæum Medianum, &c. 1s 6d. *Baker.*

Ode on beauty. 6d. *Comyns.*

—— on the power of eloquence. 1s. *Dodſley.*

Pædo-baptiſm, part ii. 1s. *Waugh.*

Paul's anti-chriſtian opera. 6d. *Keith.*

Pilkington's poet's recantation. 6d. *Collier.*

Political obſervations on the characters of the Roman emperors. Tranſlated from the Italian. No. I. 6d. *Swan.* to be continued weekly.

Praiſes of Iſis. 1s. *Dodſley.*

Precepteur, a new paper in French. To be continued once a fortnight. 3d. *Wilſon.*

Queries to count Zinzendorff. 6d. *Robinſon.*

Reflections (ſerious) on the dangers of uſing copper veſſels. 1s. *Cooper.*

Remarks on the importance of the whale-fiſhery, by a merchant. 1s. *Cooper.*

——— on the preſent ſituation of affairs. 1s. *Corbett.*

Romaine's comment on the 107 pſam. 2s. 6 d. *Withers.*

Sherlock (Dr.) late maſter of the Temple, now lord biſhop of London, his diſcourſes, 2d vol. 5s. *Whiſton, Owen* and *Baker.*

Sayer, on the power of ſociety to annul the marriage of minors. 1s. *Millar.*

Scene of Scenes, being E. Canning's dream. A print. 6d. *Cooper.*

Seagrave on the principles of liberty. 6d. *Noon.*

Serious and free thoughts on the church and religion. By a chriſtian, 6d. *Waugh.*

Shebbear's practice of phyſic. 2 vols. 8vo. 10s. *Hodges.*

Stacks (Dr.) his tranſlation of Dr. Mead's Medica ſacra. 4s. 6d. *Brindley.*

Supplement to Rimius's narrative of the Herenhuffers. 2s 9d. *Linde.*

Swift (Dean) his life. Written by his nephew. 5s. ſewed. *Bathurſt.*

Syke's paraphraſe and notes upon the epiſtle to the Hebrews. 6s. Knapton.

Truth and Falſhood. A tale. 6d. *Cooper.*

Tuner letter the fourth. 6d. *Cooper.*

Tunſtall on the power of the ſtate to prohibit clandeſtine marriages. 1s *Rivington.*

View of lord Bolingbroke's philoſophy. Letter iii. 2s *Knapton.*

Voltaire's general hiſtory of Europe. Part iiii. 2s. 6d. *Nourſe.*

Wiſdom and policy of the French, in the conſtruction of their great offices. 1s. 6d. *Baldwin.*

EACH DAY's *Price of* STOCKS, *in* FEBRUARY 1755.

☞ Books ſhut, is ſignified thus, ———

Days	BANK Stock.	E.-India	South Sea	S. Sea old An. 1ſt Su	S. Sea old A. 2d Sub.	S. Sea An. new 1ſt S.	S. Sea An. 2d Subſc.	3½ Ba. An 1ſt Subſc.	3½ Ba. An 2d Subſc.	3½ *per* C. India An.	3 *per* Cent India An.	Ba. 3 *per* Cents.	3 *per* Cent An. 1751.	India Bon præm.	B. Cir. *per* *l. s. d.*	Wind at *Deal.*	Days
28	129¼	No Price.	———	102¼a⅞	No Price.	100¼	99	101⅝a½	100⅞	100a99¾	99¼	———	99⅞a100	78s a 14	0 12 6	N b E	28
29	29¾a130	175	———	103	101	100¾	99¾	101¾a⅞	100⅝	99⅞	99¾	———	100	74s a 19	Do	N W	29
30	No Price.	No Price.	———	102⅞a103	No Price.	100¾a101	No Price.	101¼a⅞	100½	99⅞a100	99½a⅝	———	100	78s a 17	Do	N W	30
31	130	175½	———	102⅞a103	No Price.	100	No Price.	101⅞	100¼a⅝	100a⅛	99¾	———	100a⅛	77s	Do		31
1	130	175½	———	102¼	103¾a⅞	100⅞	99½	101⅞a¾	100⅜a½	100	99¾	———	100⅛	77s	0 15 0	N W b N	1
2	Sunday															W b N	2
3	129¾	No Price.	———	102¾	No Price.	100⅜	No Price.	101⅝a¾	100⅛	99⅞	99¾	———	100a99⅞	75s a 14	Do	E N E	3
4	129½a⅜	No Price.	111¼	102½a⅝	No Price.	100⅞a½	No Price.	101⅛	100¼a⅜	99¾	99½	100⅜	No Price.	74s a 11	0 12 6	W b N	4
5	128½	173½	111	No Price.	100⅛	No Price.	99⅜	101	No Price.	99¾	No Price.	99⅞	No Price.	63s	0 15 0	W S W	5
6	128¼	173¼	110¼	101¾a½	No Price.	99¾a⅝	No Price.	100⅞a¾	99¾a⅞	99	98½	99⅞a½	99	60s a 01	0 12 6	S E	6
7	127¼	171½	109½	100a99	No Price.	98¼	No Price.	100a99½	No Price.	98	NoPrice	91½	97¾	32s	0 7 6	N E b E	7
8	127½a¼	171¼	109¼	99½	98¼	98½a⅜	97½	99½	98⅛	No Price.	98	98½	97¼	42s	0 2s6a5s	E	8
9	Sunday															E b S	9
10	128½	173½	110½	No Price	No Price.	No Price.	No Price.	110¼a⅛	No Price.	98¼	No Price.	No Price.	98¼	58s a 60	0 7 6	W	10
11	No Price.	174	No Price.	100¾a⅞	No Price.	99¾	No Price.	101	No Price.	99⅛	No Price.	100	No Price.	57s a 18	0 15 0	N W b N	11
12	130a129½	175a174½	112a111¾	100¼	No Price.	100¼a⅜	No Price.	101⅜a⅛	No Price.	99½	99¼	No Price.	99⅜	58s a 19	Do	N W	12
13	129½	175½	111½	No Price.	No Price.	101⅝a½	No Price.	101½	100⅛	99⅝	99¼	100	99¼	58s	Do	N	13
14	129⅝a¾	175½	112½	102¾a102	No Price.	100¼	No Price.	101¼a⅜	No Price.	99⅝a¾	99¼	100	99½	58s	Do		14
15	No Price.	No Price.	114¼	102	100	100¼	99½	101¼	100⅜	99⅝	99¼	100⅛	99½	60s	0 17 6	S W b W	15
16	Sunday															S W	16
17	130¼	No Price.	112¾	102¼	100⅛	100¼	99¾	101¾a⅞	No Price.	99¾	99½	100⅛	100	61s	1 0 0	N W	17
18	130¼a131	176	112¾a113	102½a¾	No Price.	101⅛	No Price.	102⅛	100⅞a101	100½a¼	100½	100⅛a101	100⅛	62s a 3	Do	N	18
19	130½a¾	175¼	112½	102½	100½	101⅛	100	101¾a⅞	No Price.	100⅛	99¾	101a⅛	100⅛	60s a 1	Do	N E	19
20	130½a¾	175½	112½a¾	102⅜a½	No Price.	101⅛a¼	No Price.	101⅞	100⅝a¾	100⅛a¼	99⅞	101⅛	100¼	60s a 1	Do	E N E	20
21	130½a¾	175½	112⅝	102½a⅝	100½	101⅛a¼	100a⅛	101⅞a102	100¼	100¼a⅛	99⅞a100	101¼	100¼a⅜	58s a 19	Do	Do	21
22	No Price.	175	No Price.	102½a⅝	100⅝	101¼	100a⅛	101⅞a102	100⅜a⅞	101⅛a¼	99⅞	101	100	60s	1 2 6	E b N	22
23	Sunday															E S E	23
24	133¾a131	176a¼	113	102½a⅝	100½	101¼	100a⅛	102⅛a¼	100⅞	100⅛a¼	99⅞	101	100¼	61s	1 2 6	E N E	24

Prices Corn.	Mark-Lane.	Baſingſtoke.	Reading.	Farnham.	Henley.	Guildford.	Warminſter.	Devizes.	Glouceſter.	London.
Wheat	22s to 26s qr.	05l to 6l load	06l to 8l load	105s to 135 load	06l to 7l 15s load	07l 7s 6d load	27s to 34s qr.	25s to 32s qr.	5s od buſh.	W. Pec. Loaf 19d
Barley	14s to 14s 6d	13s to 14s qr.	16s to 18s od qr	14s to 4s 9d qr.	16s to 18s qr.	15s to 16s od qr	13s to 16s	12s to 15s	2s to 2s 4d	
Oats	12s to 14s 6d	13s to 14s od	14s to 16s od	13s to 14s 9d	13s to 17s	12s to 13s 6d	11s to 13s	12s to 14s	1s 6d to 8d.	
Beans	17s to 18s od	20s to 23s od	19s to 23s od	20s to 21s 6d	21s to 24s	24s to 26s	23s to 27s	22s to 25s	2s 8d to 3s	

Miſcellaneous Correſpondence,

For MARCH, 1755.

The ESSAY on the *Uſefulneſs* of MATHEMATICAL LEARNING, *continued from Page* 18 *of our laſt.*

If we conſider to what perfection we now know the courſes, periods, order, diſtances, and proportions of the ſeveral great bodies in the univerſe, that fall within our view, we ſhall have cauſe to admire the ſagacity and induſtry of the *mathematicians*, and the power of *numbers* and *geometry*.

With reſpect to *light*, how unſucceſsful are enquiries about this glorious body, without the help of *geometry*! Thoſe verſed in this ſcience, have diſcovered, that it has two remarkable properties, the reflection and refraction of its beams; and from theſe, have invented the noble ſciences of *optics*, *catoptrics*, and *dioptrics*. They have alſo demonſtrated the cauſes of ſeveral celeſtial appearances that ariſe from the inflection of its beams, both in the heavenly bodies themſelves, and in other phœnomena, as the *parhelia*, the *iris*, &c.

Of *air* and *water*, we know little but what is owing to *mechanics* and *geometry*. The two chief properties of *air*, its gravity and elaſtic Force, have been diſcovered by mechanical experiments. From thence the decreaſe of the air's denſity, according to the increaſe of the diſtance of the earth, has been demonſtrated by *geometers*, and confirmed by experiments of the ſubſidence of the *mercury* in the *Torricellian experiment*. From this, likewiſe, by the aſſiſtance of *geometry*, the height of the atmoſphere has been determined. Here alſo mathematicians conſider the different preſſures, reſiſtances, and celerities of ſolids in fluids; from whence they explain many appearances of nature that are unintelligible to thoſe who are ignorant of *geometry*.

In the *animal kingdom*, we ſee the brigheſt ſtrokes of divine mechanics: and whether we conſider the *animal œconomy* in general, either in the internal motion, and circulation of the juices, forced through the ſeveral canals by the motion of the heart, or their external motions, and the inſtruments with which theſe are performed, we muſt reduce them to mechanical rules, and confeſs the neceſſity of the knowledge of mechanics, either to underſtand them ourſelves, or, to explain them to others. But, if we conſider not only the animal œconomy in general, but, alſo the wonderful ſtructure of the different ſorts of animals, according to the different purpoſes for which they were deſigned, the various elements they inhabit, the ſeveral ways of procuring their nouriſhment, and propagating their kind, the different enemies they ſtruggle with, and the accidents they are ſubject to, here is ſtill a greater need of *geometry*.

As to the two other kingdoms, *mathematics* have been applied to explain the nature of vegetation, to foſſils, and other parts of natural hiſtory. And, I ſhall only add, that, if we conſider motion, the great inſtrument of the action of bodies upon one another, its theory is entirely owing to the *geometers*, who have demonſtrated its laws, both in hard and elaſtic bodies; ſhewed how to meaſure its quantity, how to compound and reſolve the ſeveral forces by which bodies are agitated,

tated, and to determine the lines which thoſe compound forces make them deſcribe: of ſuch force is gravity, being the moſt conſtant and uniform, that it affords a great variety of uſeful knowledge, in conſidering the ſeveral motions that happen upon the earth; as the free deſcent of heavy bodies; the curve of projectiles, the deſcent and weight of heavy bodies, when they lie on inclined plains, the theory of the motion of pendulous bodies, *&c.*

(To be continued.)

We have received the following Anſwer, *only, to Queſtion* I. *in* N°. I. *and this from Mr.* DUNN, *Accomptant and Teacher of the Mathematics in* London, *who after obſerving particularly what Dr.* WALLIS, *Mr.* CUNN, *and others have done by circulating Numbers, ſays,*

FIRST, in multiplication, let $\frac{N}{D}$ be any vulgar fraction, and $\frac{n}{d}$ another vulgar fraction to be multiplied by the former, and the product will be $\frac{Nn}{Dd}$ exactly, without error.

For example, $\frac{89}{6} \times \frac{65}{3} = \frac{5785}{18} = 321\frac{7}{18} = 321.3888$, whereas, had the decimal of $\frac{89}{6}$ been taken 14.83 and that of $\frac{65}{3} = 21.66$, the product would have been but 321.2178, which is $\frac{1}{6}$ of an unite leſs than the truth.

To correct this error univerſally, let the vulgar fractions be reduced to decimals, and the remainders preſerved.

Thus, in the aforegoing example, $\frac{89}{6}$ will be $= 14.83\frac{1}{3}$ and $\frac{65}{3} = 21.66\frac{2}{3}$ the decimal places being continued no farther than is convenient. Putting the whole numbers, and decimal parts, in the multiplicand $= M$, and thoſe in the multiplier $= m$, the fraction in the multiplicand $= F$, and that in the multiplier, $= f$, the exact product (if ſuch be required) will be $Mm + Fm$, $+ fM$, $+ Ff$; but, as in all caſes, the error ariſing by a neglect of Fm and fM, will be very great, with reſpect to Ff, which will be always leſs than unity in the leaſt decimal place of the product, we may reject Ff, on account of its ſmallneſs, and take $Mm + Fm + fM$ for the product required. In the former example,

$$
\begin{aligned}
Mm &= 321.2178\\
Fm &= .0988\\
fM &= .0722\\
\hline
\end{aligned}
$$

And, 321.3888, *&c.* the correct product as above.

And thus may all decimal products whatſoever be made quite correct, the multiplicands and multipliers being always derived from forms, like the above, *viz.* $\frac{N}{D} \times \frac{n}{d}$.

Secondly, In Diviſion, let $\frac{n}{d}$ be any vulgar fraction, and $\frac{N}{D}$ another vulgar fraction to be divided by the former; and the quotient will be $\frac{Nd}{Dn}$ exactly, without error, or $\frac{N}{D} \times \frac{d}{n}$, or $\frac{d}{D} \times \frac{N}{n}$. Thus in the foregoing example $\left.\frac{89}{6}\right)\, \frac{5785}{18} \left(= \frac{34710}{1602} = \frac{65^{*}}{3} = 21\tfrac{2}{3}\right.$, Or, by the firſt of our aforegoing forms, the quotient will be $\frac{5785}{18} \times \frac{6}{89}$. Here $\frac{N}{D} = \frac{5785}{18} = 321.38\tfrac{8}{9}$, $\frac{d}{n} = .06\tfrac{66}{89}$.

$$\begin{aligned} \text{Hence } Mm &= 19.2828 \\ Fm &= .0005 \\ fM &= 2.3832 \\ \hline \end{aligned}$$

And $21.6666 = 21\tfrac{2}{3}$ the correct quotient as above. And thus may all decimal quotients whatſoever be made quite correct, the dividends and diviſors being always derived from forms like the above, *viz.* $\frac{N}{D} \times \frac{d}{n}$, or $\frac{d}{D} \times \frac{N}{n}$.

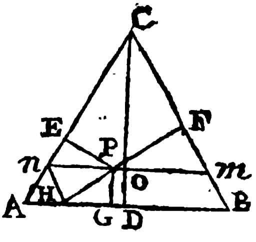
Theſe caſes and methods of correction I invented, ſeveral years ago, for correcting the decimals in long and accurate calculations, in which I have often found them more ready and uſeful than the method of circulates, and accordingly recommend them to the arithmetician.

Threadneedle-ſtreet,
13 March, 1755.

Question 2. *Anſwer'd by* M***.

IN an equilateral triangle ABC, let P be a point taken, and PF, PE, and PG, perpendiculars to the ſeveral ſides.

Thro' P, parallel to any ſide (AB), draw mn, which biſect in O with the perpendicular CD. In FP produced, take PH = PE, and join Hn. 'Tis evident that the angle PHn will be a right angle, and conſequently that FH = PF + PE = CO = height of the equilateral triangle mCn; and if to theſe, PG = OD be added, we ſhall have PF + PE + PG = CD.



Q. E. D.

An Anſwer to the anatomical Queſtion in the laſt MAGAZINE.

IN relation to the queſtion before us, it may be anſwered in general, that the blood returns to the heart, after an amputation, in the ſame manner, as it did before.

It is preſumed, the gentleman's difficulty, who propoſed this queſtion, aroſe from his ſuppoſing, that the arteries paſs on to the extremities of the limbs, before they communicate with

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* See vulgar fractions in this magazine.

the returning veins. Upon this ſuppoſition, indeed, after an amputation has been performed, whatever blood might be brought to the ſtump by the arteries, it is certain, none of it could be carried back again to the heart; becauſe the intercourſe between the arteries and veins, in the remaining part of the limb, would in this caſe be entirely cut off.

But, contrary to the foregoing ſuppoſition, it is well known, to ſuch as have been converſant in anatomical diſſections, that, from the ſides of the larger arteries, as they paſs on to the extremities, there go off a great number of leſſer branches, which conſtantly communicate with correſpondent branches of the returning veins. And hence, it is eaſy to conceive, how the circulation is carried on, after an amputation has been performed.

Suppoſe, for inſtance, an amputation to be performed above the knee, and let us ſee how the circulation is carried on in the remaining part of the limb.

The blood, we know, is brought to the thigh, by the crural artery, which a little below the ham is divided into two principal branches, which diſtribute the blood all over the leg and foot. The blood, thus diſtributed, is returned by the crural vein into the inferior trunk of the *vena cava*, and ſo back again to the heart. But, before the crural artery arrives at the ham, it ſends off a great number of lateral branches to the muſcles of the thigh, and the ſurrounding teguments; as well for the nouriſhment of the limb, as to ſupply a quantity of blood, ſufficient for the performance of muſcular motion. Theſe arterial branches, every where communicate with correſpondent venal branches, which ariſe from, and empty themſelves into the crural vein. And thus, by means of theſe collateral blood-veſſels, the circulation is regularly carried on, through every particular part of the limb; the main trunks of the crural artery and vein, ſerving to convey the blood into, and receive it from theſe leſſer branches.

This then being the caſe, it is plain, that an amputation, performed above the knee, can no otherwiſe affect the circulation, than by ſtopping the progreſs of that blood, which was about to be ſent into the leg. In the mean time, the courſe of the blood, through the collateral arteries and veins, will be no ways interrupted, by the operation: and therefore, the circulation will be continued through the remaining part of the limb, and the blood returned to the heart, in the ſame manner, after the amputation, as it did before.

At firſt, indeed, the impetus of the blood, upon the lateral arteries, will be conſiderably increaſed, becauſe, that blood, which uſed to be ſent into the leg, will now be obliged to paſs all this way. But this is an effect, that commonly ceaſes as ſoon as the digeſtion of the wound is compleated, after which, the circulation is carried on with the ſame eaſe and freedom, as it was before the operation.

Monmouth, March 10, 17

SIR,

I believe the following Anſwer to the PARADOX, *in your laſt, is right.*

J. M. T.

8	1	6
3	5	7
4	9	2

QUESTION 8. *By a Correſpondent.*

GIVEN any fraction; to find the leaſt whole number, which multiplied by the numerator and that product divided by the denominator ſhall leave no remainder?

QUESTION 9. *By* T. L.

GIVEN the altitude of a conical glaſs 3 inches, and its diameter 4 inches, it being $\frac{1}{4}$ full of liquor; to find the diameter of a round ball, which, being put into the glaſs, ſhall raiſe the liquor to the greateſt height?

QUESTION 10. *By the ſame.*

GIVEN the length of a cylindrical walking ſtaff 40 inches, and its diameter $\frac{3}{4}$ of an inch; to determine the neareſt diſtance from the hand end, where it will ſtrike a blow equal to that with the fartheſt end, ſuppoſing the centre of motion to be at the hand.

A Deſcription of the EPHEMERON FLY.

THOSE animals, which from time to time, we judge worth a particular deſcription, and a copper-plate, and are common to all places, we ſhall introduce as we have occaſion, as they all belong to a general natural hiſtory of the world. And we ſhall here begin with that moſt curious of all the inſect-tribe, call'd the *Ephemeron-Fly*; which epithet it has on account of its very ſhort period of Life, which is allotted to it in the *fly-ſtate, viz.* but a *ſmall part of a day*. The natural hiſtory of this creature has been hitherto very imperfect; but, as we have kept them conſtantly under our eye, for near two years together, we ſhall be able to give our readers, a more compleat and ſatisfactory account of it.

This *fly* is the moſt beautiful ſpecies of the *Gnat-kind*, and undergoes the greateſt variety of metamorphoſes, or different ſtates of life, perhaps, of any other whatſoever; theſe are no leſs than *five, viz.* (1.) The *Ovum*, or egg. (2.) The *Eruca*, worm, or maggot. (3.) The *Cryſalis*. (4.) The *Nympha*. And (5.) The *Gnat*, or fly.

The *Gnat* having laid its eggs, they lie in the water for ſome time, till the warmth of the ſummer-ſun hatches them; and from each is produced a ſingle *Eruca*, or worm, of a red colour, a ſmall ſize, and in motion always reſembling the letter S; for it throws itſelf forwards conſtantly in that form. In this ſtate, you ſee it in ponds and puddles of water, during all the warm months of the ſummer; for, when the water begins to be cold, this provident creature begins to make itſelf a *theca*, or caſe, with the fineſt materials of vegetables and earth mix'd, and agglutinated, and in which it abides during the winter-ſeaſon; in the latter part of which it ceaſes to be a worm, and is changed into its third, or *cryſalis*-ſtate, in which it continues dormant till the ſpring advances, and, by degrees, is transform'd into a beautiful *Nympha*, or fiſh-like ſtate, which is exactly repreſented in the plate. Under this form it continues two or three months, till about the middle and latter end of *May*; from each of theſe, the *Gnat*, or *fly*, is produced.

We have frequently been entertain'd with obſerving the manner of this wonderful *metamorphoſis*; the *Nympha*, on the day deſtin'd for its change, appears ſluggiſh and inactive, and about 3 o'clock in the afternoon, becomes nearly motionleſs; in this ſtate it continues till about 5; when the head of the Gnat firſt begins to appear, gently riſing above the ſurface of the water; after this, the body aſcends ſlowly, and in a poſition perpendicular, upright, till at length the whole is excluded from the *exuvia* of the *Nympha*; and the new-born *Gnat* falls flat on the ſurface of the water, and for a few minutes is quite without motion; this proceſs takes up near an hour. The *Gnat* is excluded, full grown, and in a ſhort time begins to move its wings very tenderly, and ſoon it begins to gather life, (if we may ſo ſpeak) and at laſt, riſes up on its legs, and flutters its wings; then gently attempts to walk, and ſoon after to fly; and this being the caſe with many of them at the ſame time, they friſk and play about, on the ſurface of their native waters, for the ſpace of two Hours, when the males and females find each other out, and aſſociate together, for about two hours more; they then purſue their promiſcuous flighty dance, as before, lay their eggs, and, in a ſhort time, fall down dead, and never move any more; finiſhing their ſhort period of life, in about five or ſix hours time; for they generally expire at eleven o'clock, at night. We once, with much care, kept one, (of many we try'd) till about twelve, the next day.

Obſervations on the Weather, by ſeveral Inſtruments, for the Month of MARCH.

A Philoſophical hiſtory of the weather, for each paſt month, we judge, will be very acceptable to the public, as it is equally a matter of utility and curioſity. There is nothing, in which a perſon is more intereſted, than the article of *health*, which every one ought to know depends greatly upon a thorough knowledge of the ſtate of the weather; and this, we can by no means acquire, but, by the application of proper inſtruments, which may faithfully indicate to us, at all times, whatſoever relates to the *weight* of the air; to the heat and cold thereof; to the *moiſture and dryneſs* of it; the *quantities of rain*; the *courſe* of the *wind*, &c. which properties of the air, being known for the month paſt, makes it eaſy to judge what it is, and will be for the preſent month; and conſequently we are thereby the better prepar'd to guard againſt thoſe diſorders, that we obſerved moſt rife and predominant at any particular ſeaſon, or temperature of the air.

In order to this, we ſhall lend the beſt aſſiſtance we can, by careful obſervations made every day, at noon, on the following inſtruments, *viz.*

I. The BAROMETER, which ſhews the *weight of the atmoſphere*, from time to time.

II. The THERMOMETER, which ſhews the *temperature* with reſpect to *heat* and *cold*.

III. The HYGROMETER conſtantly ſhewing the *moiſture and dryneſs* of the air.

IV. The PLUVIAMETER, which ſhews the *quantity of rain* falling on a given ſpace, in a given time.

V. The ANEMOSCOPE ſhewing the *direction*, *velocity*, and *force of the wind*.

Of theſe, we have already conſtructed ſome; and the reſt will follow in time. The obſervations on the *Barometer*, *Thermometer*, and *Pluviameter*, you have in the table below; to which, in the next number, we ſhall add, the *Hygrometer*, and *Anemoſcope*.

March	Barometer	Thermometer	Pluviameter
1	29 : 5	19	0 : 0
2	29 : 8	20	0 : 3
3	29 : 7	23	13 : 0
4	29 : 7	23	4 : 6
5	29 : 3	23	0 : 9
6	28 : 7	22½	6 : 0
7	29 : 1	20	10 : 8
8	29 : 5	18	2 : 4
9	29 : 7	18½	16 : 7
10	29 : 7	18¾	3 : 8
11	29 : 6	19	0 : 0
12	29 : 0¾	19	12 : 0
13	29 : 8	19¼	0 : 0
14	29 : 7	19	0 : 0
15	29 : 5¾	19½	0 : 0
16	29 : 4¾	20	5 : 4
17	29 : 5¾	21½	2 : 1
18	29 : 7½	19¾	0 : 2
19	29 : 8¼	18¾	0 : 0
20	29 : 8	19	0 : 0

The

The COPERNICAN SYSTEM. *By* SAM. EDWARDS. *A. B.*

ASSIST, *Urania*, the advent'rous ſong,
That from the tow'ry height of heav'n doſt view
Unchang'd *rotations*, and harmonious *ſpheres*;
By thee, th' inſpir'd *Chaldæan* firſt obſerv'd
The various motions of the ſhining *ſtars*,
And mark'd the *riſing* or the *ſetting Sun*,
Whether in *Aries*, or in *Libra*, ſeen,
His courſe performing thro' th' *Æthereal ſpace*
By *twelve* conſpicuous *ſigns* well known, that ſhew
The utmoſt margin of his rapid ſway:
In ancient times ſo thought: but now the *Sun*
Fix'd in the *center* of *ſix orbits* glows,
Light'ning *ſix planets* that around him roll;
Fix'd, as o'er *Gibeon* once when ſtill he ſtood,
Or as the *Moon* in lowly *Ajalon*,
When *Joſhua*'s mighty arm deſtroy'd the foes
Of *Iſrael, and Jehovah*, *Iſrael*'s Lord:
Hence light and Heat imparting all around,
(Diffuſive fountain both of light and heat)
And vegetative force to all extends,
From glowing *Mercury* to *Saturn*'s frozen orb.
Say, *Muſe*, for well thou know'ſt, what *planet* firſt
The Sun ſurrounding, takes its ambient courſe;
Swift *Merc'ry* feels the firſt the burning Sun,
That erſt in Air us'd unconfin'd to rove,
The nimble-footed meſſenger of heaven;
Now cloſe confin'd, a narrower limit knows
In fiery regions, and the blaze of day:
Dark with exceſſive luſtre, ſeldom ſeen
By eyes on *earth*, but when th' all-ſeeing *Sun*
Hid and eclips'd by th' intervening *Moon*
Unwillingly is loſt; 'tis only then,
Thou *Mercury* art viſible on *Earth*.
Swift is his motion, as the tract not large,
That moving in his *Circlet* he deſcribes,
For in the ſpace of three revolving moons
His journey finiſh'd, he again renews.
To thee, O *Venus*, next, I tune my ſong,
As next in order plac'd, ſo next in light;
Goddeſs of pleaſing and of ſoft deſire,
That on the *Paphian* and the *Cyprian* groves
With influ'ence ſweet look'ſt down, thy parent ſeas
Behold rejoicing, when thy ſhining lamp
Aſcending, or deſcending, cuts its way:
Whether thou'rt *Heſperus*, or *Phoſp'rus* call'd,
Now th' evening's grace, and now the morning's pride;
For if at ſetting Sun thy orb we view,
When doubtful twilight overſhades the face
Of heaven and earth, thou *Heſperus* deign'ſt to hear;
But if at morn we ſpy thy glimmering rays,
'Tis then thou'rt chang'd, another and the ſame;
Bright *Phoſphor* hail!——to watchful ſhepherds known,
That in the meadows tend their fleecy care,
Greeting the day with merry pipe and glee.
Nor does the *Moon* alone her figure change,
Ev'n thou art mutable, alike thy form,
Horn'd, or *full orb'd*, at diff'rent times appears;
Tranſported at the ſight, old *Vulcan* ſmiles,
In air to ſee thee by thoſe ſigns adorn'd,
Which he on earth, for thee contented bore.
Bright as thou art, and cloath'd in lucent beams,
Yet when in cloſe *conjunction* with the Sun,
A ſpot in his reſplendent *Diſk* thou'rt ſeen,
And deck'ſt his cheeks, as *Daphne* once his brows:
But oh! more kind, for never in thy round
In point of *oppoſition* art thou ſeen.
Next rolls this *Earthly Ball*, the ſeat of *man*,
Obliquely cutting its ætherial courſe
Thro' *twelve bright conſtellations*; that adorn
Heav'n's azure vault, unalterably fix'd.
Firſt in his golden fleece the *Ram* leads on
With wonder and aſtoniſhment the *Bull*;
Fierce, as when once a God he ſtemm'd the ſea,
Bearing his lovely burden thro' the waves,
Secure of tempeſt: but not ſo *Leander*,
Proſp'rous, attain'd the long wiſh'd *Seſtian* ſhore.
Then next advance the *Twins*, and then the *Crab*,
The brindl'd *Lyon*, and the bluſhing *Virgin*,
And *Libra* next, that weighs in equal ſcales
Day anſw'ring night in length, and night the day.
The *Scorpion* now ſucceeds, a fiery ſtar
Stretching amain his formidable claws;
Whence *Cæſar* kens the votive world below,
If *Cæſar* haply ſhines a ſtar on high,
And ſheds ſweet infl'ence down on thee, O *Rome*.
The hideous *Archer* next with full-bent bow,
Half man, half beaſt, a monſter terrible,
As e'er was feign'd to guard th' æthereal plains.
Then bearded *Capricorn* attracts our view,
Looking with wiſhful eyes upon the *Urn*,
Guſhing with fluent ſtreams, as many a *Goat*
On craggy mountains top in ancient *Wales*,
Or from the *Wreeking*'s vaſt ſtupendous height
Looks down upon the *Severn*'s ſilver ſtreams,
Laving the flow'ry Banks of fruitful *Salop*.
The wint'ry *Fiſhes* cloſe the heav'nly rear,
Their ſtation 'tween *Aquarius* and the *Ram*.

Lo! theſe the ſigns of days, of months, and years;
For when, thro' twelve bright conſtellations, Earth
Unweary'd hath her radiant journey run;
From whence it firſt ſet out, it takes its courſe.
Times alſo and their ſeaſons well they note;
For when the Sun in fleecy *Aries* ſets,
The freſh returning ſpring, the heart of man
And beaſt rejoices, with new vigour fraught,
Pleas'd to behold the captivating ſcene,
When new-ſprung glories raviſh ev'ry eye,
And ſweet variety adorns the meads,
Oh! then how pleaſurable 'tis to rove
On banks of *Cam*, or *Iſis*, fam'd in ſong,
To meditate the great *Creator*'s praiſe;
Who in his works ſo manifeſt is ſeen,
As far as nature can her Author paint!
But when th' exalted Sun in *Cancer* rides,
Exceſſive heats enſue; 'tis then the plains
Parch'd, and divided into many a crack,
Gape and invoke the long ſuſpended ſhow'rs;
Deep-ſounding thunders roll, while from the clouds
The long impriſon'd vapours burſt their way,
And the red light'nings dart their dreadful gleams,
Making day hideous: — Round the grazing beaſts
Fly trembling, and their dark receſſes ſeek.
When equal *Libra* next brings forth the day,
And raging *Sirius* fierce at midnight glares,
Preſaging ſtorms, and peſtilence, and death;
Then frequent fun'rals in long order ſhine,
And add a double horror to the night;
And wider would extend their dreary doom,
But for the chearful gift of that kind God,
That loads with cluſt'ring grapes the bending vines.
But when *Aquarius* ſheds its humid infl'ence,
Dark miſts the trav'ler feels: —— But ſtay, my *Muſe*,
Urge not a theme already ſo well ſung,
Smooth, as the ice, they ſing, thy numbers flow,
**Great Bard* we quake, and ſhudder at thy froſt:
O! may they never, who deſpiſe thy *Muſe*,
Alive or dead, be by thy *Muſe* adorn'd.
Nor ſhall the *Earth*'s *attendant* paſs unſung,
Sole arbitreſs of night, the pale-ey'd *Moon*,
Conſtant in her inconſtancy; 'tis ſhe
Can raiſe or can depreſs the boiſt'rous ocean,
In *Zenith* tow'ring, or in *Nadir* low:
Oft at thy pallid glimpſe the *fairy elves*,
With nimble feet, the circling dance perform
In ſome thick grove, or round a moſſy ſpring;
Sipping from acorn cups the pearly dews,
And midnight revels celebrate with joy
To *Mab* their queen, and *Oberon* their king.
Oh! thou the moſt irregular of all
The planets, that deſcribe their ſloping way,
Why is thy courſe protracted long and large,
What time the jolly huntſman's cries reſound?
Is't to behold thy lov'd *Endymion*'s face,
That oft' was wont in foreſts wild and wide,
To chaſe the ſcudding hare, or trembling deer
O'er many a riſing hill or lowly dale?
Him to reviſit oft thy ſilver ſphere
(So poets ſing) in heav'n forſaken ſtood.
Nor does the *Moon* uncertain warning give
Of future Storms; for if a reddiſh hue
Its full orb'd diſk o'erſpreads, then ſtorms expect
And tempeſts yet to come, to vex the main
With rage impetuous; who then would chooſe
Way-ward abroad companionleſs to rove,
Thro' dreary deſarts and unpeopl'd plains?
Nor equal always is thy luſtre ſeen,
For dim ſuffuſion oft' and duſky ſhade,
From earth projected, intercepts thy light,
Whole, or in part eclips'd; in vain the ſound
Of tinkling cymbals, and the direful clang
Of brazen cauldrons, rung by vulgar hands,
Thy labours thus attempt to mitigate.
Next fiery *Mars*, whoſe dreadful ſport is war,
Aſcending terrible ſhoots forth his rays
That led th' imbattl'd deities to fight;
Now unattended ſhines: for no fair moon
By night his ſphere adorns, but fierce his look,
Fierce, as when once he rag'd at *Ilium*'s walls
When ſtruck by *Diomed*'s advent'rous arm:
But oh! what luckleſs fate, what chance of war,
Great Hero, led thee in ill-fated hour,
With erring lance to wound fair beauty's queen.
Majeſtic next, and ſlow in awful ſtate,
Rolls *Jupiter* immenſe; an equal bulk
Of all the wand'ring planets none can boaſt;
Attended in his courſe by four bright moons,
That faithful lend their well accepted light.
Thus equal, nature in her works decreed,
By Moons to aid a twelve years winter's froſt:
Nor ſummers there, if ſummers there be known,
Refuſe th' aſſiſtance of thoſe grateful lights.
Nor do thy *Moons* alone our wonder raiſe,
When curious we behold thy many *Belts*
That gird thy ſpacious body round and large,
Form'd from thick vapours or eruption dire;
Or was't from hence thy flaming light'nings flew,
Drawn to transfix the raſh *Titanian* race

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* *Mr*. Thompſon, *author of a poem, called* Winter.

That with preſumptuous arms provok'd thy pow'r,
O'er mountains heap'd on mountains, when they ſtrove
Thy empire to diſpute in impious war.
Next then — but a long interval between,
Behold we tardy *Saturn*'s livid face,
In diſtance far remote; the *ſolar rays*
Scarce chear with light his unrejoicing *orb*;
But for five moons, that in alternate dance
Around him as their center circling move,
Darkneſs intenſe would overſpread his face.
Nor mean the light, that from thy lucent ring
Pow'rful reflected on thy ſurface ſhines,
That now a *gilt horizon* round thee ſeems,
Like to that light at cloſe or dawn of day
When ſeen on earth; now a reſplendent arch
'Midſt heav'n's extended plains, like that fair bow,
Conſpicuous in the clouds, preſaging calms.
Our labour now the direful *Comets* urge,
Glaring tremendous thro' the vaſt expanſe,
Threat'ning deſtruction and the wrecks of worlds;
But that ſtrict bounds direct and guide their courſe,
Set, when th' *Almighty* in creating hour
From chaos call'd the glorious univerſe,
And fix'd the ſtars, and bid the planets move.
Where *Æther*'s ſpace immenſe eludes our view,
And Planets in their orbs in order range,
There free, as air, the fiery comets rove,
And direful orbs their rapid courſe extends.
Nor are their ways confus'd, or intricate,
Irregular in winding mazes loſt,
Eccentric error conſtant to itſelf,
To one law ſubject; one unerring rule
Of *force attractive*; thus unweary'd they
Now ſweep the utmoſt confines of the world,
Now baſking in the neighb'rhood of the ſun;
Then ſwiftly flying his too piercing heat,
Rejoicing, they aſcend their labours to reſume.
Long tracts of light attend their dreadful courſe,
But truſt not to thy view a *foreign* light,
And ſpurious Honours deck their glowing maſs;
Denſe atmoſpheres emit their furtive beams,
Frequent and thick, by heat intenſe exhal'd:
The moon thus, with fraternal luſtre bright,
Darts borrow'd rays, and glories not her own.
There are, that fate foretelling fires believe,
And conſcious ſtars t' inſpect the acts of men,
And threaten bloody wars from diſtant climes to come.
Hence ſtupid and amaz'd, the vulgar fear,
And ſceptr'd monarchs tremble on their thrones;
Then happy he, who with his virtue arm'd,
Unterrify'd amidſt the cruſh of worlds,
Meets willingly his long expected fate.
But oh! ye lights, and influencing ſtars,
Where then was fled your efficacious pow'r,
When tow'ring *NEWTON*'s eyes were clos'd in death,
Or were ye bent his preſence to obtain,
To whom on earth ſo well your ways were known?
Hail! glorious ſhade, in ancient times foretold
[*] By *Sage* prophetic; thou th' illuſtrious he
Deſtined to grace a new *Auguſtan* age;
But when th' archangel's lateſt trump ſhall ſound,
And riven orbs deſtruction dire confeſs,
Then ſhall thy ſyſtem fail, and nature's face
Renew'd in everlaſting luſtre ſhine.
Then *death* ſhall conquer *death*, the dreary *tomb*
Shall ſend forth glories that ſhall never fade.
The *damn'd* ſhall mourn the funeral of *death*,
And life, not *death*, of ſin the *wages* be.
Frauds dark as night, and civil diſcords brood,
When ſtars ev'n bluſh at what is done below;
For ne'er in heav'n more frequent fires were ſeen,
Than when the blood of *Cæſar* tinctur'd *Rome*.
Nor doſt thou, *Rome*, alone the ſlaughter weep
Of fathers, children, brothers, huſbands, wives,
Ev'n *Albion* once in grief could vie with thee,
When *Albion*'s ſons, 'gainſt *Albion*'s ſons aroſe.
But ceaſe inteſtine broils; ſo *GEORGE* commands,
And whet your ſhining inſtruments of war,
Employ'd much better on *Iberian* plains;
And teach the treach'rous ſoul in war to know
The juſt reſentment of a peace refus'd,
Of violated leagues, and broken faith:
Aſtræa ſhall return to bleſs our iſle,
And a new ATHENS in *BRITANNIA* riſe.

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[*] Seneca.

PSALM LXXIII. *Imitated.*

IT muſt be ſo: — for God is good to thoſe,
Who, pure of heart, their truſt in him repoſe;
Yet, late I rov'd aſtray, perplex'd and blind,
For clouds of error hover'd o'er my mind;
I griev'd, I envied, to ſee fortune's tide
Flow on the ſons of wickedneſs and pride:
Firm is their ſtrength, not ſubject to decay;
With age alone, their vigour dies away:

The cares, the toils of life they ſeldom ſhare;
Slight are their troubles, their afflictions rare:
How ſmooth their brow! their eye, how full of fire!
While luxury of wealth, exceeds deſire. —
Minions of fortune! ſee the gaudy train,
Oppreſſive, cruel, haughty and prophane;
Corrupt of ſoul, licentiouſly they ſpeak,
Defraud the poor, and perſecute the meek.
Their impious tongues, with daring eloquence,
Attack the ſacred ways of Providence.
Fearleſs they aſk, "Does the Almighty know?
"Where are the traces of his Care below?
"Who are his fav'rites? can the ſages tell,
"And point us out a local heav'n, or hell?"
Behold, O God, theſe proſp'rous ſons of vice,
Who paſs their days in riot and caprice.
Abaſh'd, I cry'd, my heart, I've purg'd in vain,
And to no purpoſe, waſh'd off every ſtain;
Cautious I walk, dejected and forlorn,
Plagu'd every eve, and chaſten'd every morn:
Adverſity, the manna thou let'ſt fall,
And in my cup, the wormwood's mix'd with gall.
O! let me ſpeak theſe truths; for, ſpeak I muſt,
Without offending the ſupreme and juſt!
How my heart labours with the painful thought,
Too exquiſite in language to be wrought!
But when I in thy ſanctuary bow,
With full conviction, I their danger know;
Dreadful the precipice on which they ſtand!
For dire deſtruction waits on either hand;
I view their end with horror and amaze;
Their life a vapour, and their wit a blaze. —
As from a dream, hereafter they muſt 'wake,
When thou, O God, ſhalt inquiſition make,
Give vice its anguiſh, virtue its delight,
Prove thy ways equal, and thy judgments right.
While thro' this vale I tread, thy preſence chears,
Thy hand ſupports, and mitigates my fears;
Thou wilt hereafter, tho' on earth diſtreſt,
Lead me to glory, and eternal reſt.

CRITO.

We have been obliged to make many corrections in the above, which otherwiſe would not have ſuited our purpoſe.

CROSS PURPOSES. A SONG.

PALÆMON lov'd *Paſtora*,
Paſtora ſigh'd for *Damon*;
But *Damon* lov'd *Aurora*,
Aurora young *Palæmon*.

Palæmon gave *Paſtora*,
A wreath and ſhepherd's crook;
And *Damon* gave *Aurora*
A knot and reaping-hook.

Paſtora gave to *Damon*,
A cap with chaplets crown'd;
Aurora gave *Palæmon*,
A pipe with hazel bound.

The cap with chaplets crown'd,
Young *Damon* gave *Aurora*;
The pipe with hazel bound,
Palæmon gave *Paſtora*.

The wreath and ſhepherd's crook,
Paſtora gave her *Damon*;
The knot and reaping-hook,
Aurora gave *Palæmon*.

So croſsly-turn'd, their preſents went,
Their Love's ſo oddly varied,
That every token that was ſent,
Its true deſign miſcarried.

The STATUARY on NEWGATE.

ON the outſide of *Newgate* ſtand fair to be ſeen,
Juſtice, Liberty, Mercy, Truth, Plenty and Peace;
What a happy reverſe would it be, if within
We could ſee, ſuch a train of bright virtues as theſe?
In mis'ry no more would the wretched carouſe,
Nor the flames of dame *Gin* in their boſoms more high-burn;
No more need a windmill a'top oth' houſe,
Nor weddings, immortal, conſummate at *Tyburn*.

PROLOGUE TO *APPIUS*.

Spoken by Mr. CIBBER.

HOW great the poet's taſk, who, new to fame,
Seeks by the drama to procure a name! —
The muſe's mighty labour at an end,
Friends he muſt have; — to judge, to recommend. —
Few care to judge. What the beſt judges feel,
Ev'n they, thro' modeſt diffidence conceal. —
Witlings and critics, of a baſtard kind,
See faults indeed; but are to beauties blind.
Such, keen to nibble at a word or phraſe,
Reſign to men of ſenſe the taſk of praiſe. —

Some—riſing merit, from its dawn, oppoſe:
To ſuch, a rival is the worſt of foes.—
'Twere endleſs, it were needleſs to relate
The well-known hardſhips of an author's fate.
Each hardſhip, ev'ry obſtacle ſurpaſt,
Virginius comes upon the ſtage at laſt:
That father comes, whoſe dire, whoſe mournful deed
Rome from the bloody yoke of *Appius* freed.
For this his name was to his country dear.—
What drew the *Roman*, claims the *Britiſh* tear.
Our author hopes ſlight errors you'll excuſe;
Since who could ever boaſt a faultleſs muſe?
His *Roman* ſubject, with attention due,
With candour treated, he ſubmits to you.
To your high judgment he ſubmits his cauſe;
Alike reſign'd to cenſure or applauſe.—
Britons! your native equity diſplay,
And judge, like *Romans*, of what *Romans* ſay.

EPILOGUE TO *APPIUS*.

Written by a FRIEND. *Spoken by Mrs.* BELLAMY.

I Told the bard—(ay, yonder he ſtands quaking,
Alas! poor ſoul, he's in a piteous taking!)
I hope, ſir, you'll excuſe what I ſhall ſay;—
But truely, ſir, I tremble for your play.
There's a wild greatneſs in the plot, I own;
But then, I doubt, it may diſpleaſe the town.—
" The town (reply'd our author) diſapprove
" A plot that's built on liberty and love?
" Is not the fav'rite character a woman?
" The moral chaſte and pure? The ſubject *Roman?*"—
Roman indeed!—I hope ſuch heath'niſh nonſenſe
Will ne'er infect an honeſt *Chriſtian* conſcience.—
The ſtory may (for aught I know) be true;
But *here* no tale improbable will do.—
What, rather periſh by untimely fate,
Than ſmile upon a princely magiſtrate!
So raſh, he could not reign another year;
So rich, ſhe might have had ten thouſand clear!
And then what wiſe *Plebeian* would decline
A match with the *Decemvir*'s concubine?—
" How (ſays a critic) quit her faithful lover,
" Young, handſome, brave, for ſuch a wicked rover?
" For one—(a thouſand other faults combining)—
" That now was to the vale of years declining?—
So then, had APPIUS been but five and twenty,
The maid perhaps would not have prov'd ſo dainty.—
ICILIUS vow'd indeed, and promis'd well:
But where was he when his VIRGINIA fell?
He ſhould have ſkreen'd from death his blooming bride;
Or dy'd,—like a true lover,—by her ſide.—
VIRGINIA's death he never could ſurvive;
But that he was, in duty,—bound to live.—
He liv'd then, to diſſolve his country's chain;
Avenge his miſtreſs, and—make love again.
Then for the grim old ſire, with frenzy wild,
To be the butcher of his only child!—
True, 'twas the virgin daughter's choice to die,
Rather than bear to live with infamy.—
This muſt be *Roman*, *Engliſh*, or romance:—
Such virtue would not be believ'd in *France*.

Whereas, ſeveral of our friends, have been ſollicitous about the continuation of this work, and its being compleated in the time propoſed in our plan; we here beg leave, to aſſure them, the work is in ſo great forwardneſs in every part already, and, will be ſtill further advanced, by a daily application thereto, that, in all human probability, there will be no occaſion to fear its being diſcontinued; eſpecially, as we have received ſo great encouragement from a general Reception of the work, we ſhall be thereby animated, not only to purſue it, but alſo, to improve, and enrich our plan far beyond what we at firſt propoſed. Beſides, it ought to be conſidered, that, from the nature of ſuch a work, it muſt be compleat, as far as it goes, let it terminate where it will; ſince, the ſubjects in every part, are independent of each other, and, each one in particular, is finiſhed, in a few numbers. In the laſt place, as we write only for the ingenious, *and* ingenuous, *'tis preſumed, none of our readers can ſet any part of ſcience at ſo low an eſtimation, as to think any particular number not worth the few pence he gives in exchange for it.*

ERRATA in our laſt. Page 22, Line 6, 8, 11, 18, 19, 26, for ı read ſ.

A Chronological Memoir *of* Occurrences.

For *MARCH*, 1755.

Turkey.

THE new grand ſignior, who ſeems to do every thing in his power to gain the affections of his people, has ordered the duty on corn to be taken off.

The baſhbacha Kouli is changed and exiled. He is the ſecond officer in the tefterdarat, or treaſury, and properly the chief caſhier. Other changes are ſaid to be expected.

Genoa. Letters from Baſtia, of the 6th of February laſt, mention, that the inhabitants had been kept under arms all the 21ſt and 22d of the month then laſt paſt, the chiefs of the malecontents having laid a plan to ſurprize the city, under pretence of levying a general tax of one livre on each family, on the whole iſland. The rebels marched a corps of about 1000 men, ſecretly, in the night, near to the city, to levy the tax on the inhabitants in the ſuburbs. This was reported to conceal their true deſign, which was to ſurpriſe the old town, called Terra Vecchia, and, if it had ſucceeded, was to have attempted ſcaling the wall of the new town, called Terra Nuova.—It is not certain what could encourage them to make this attempt, only it is conjectured, that they were to be joined by ſome deſerters; but finding the inhabitants under arms, they retired without doing any thing at all.

Sweden. Several conferences have lately been held at Stockholm between the French and Spaniſh ambaſſadors, and the miniſters of this court, in relation (as 'tis ſaid) to a contract for building ſome men of war, and other ſhips for the ſervice of thoſe crowns.

Spain. We are informed that the Conception ſailed from Cadiz on the 21ſt of laſt month for Vera Cruz, and that ſeveral other ſhips are getting ready in that port for Carthagena and the South Sea.

Portugal. The fleet bound for Rio de Janeiro, conſiſting of 29 ſhips, under the convoy of a man of war, of 50 guns, ſail'd from Liſbon, a few days ago, with a fair wind. Two others, embrac'd the opportunity of ſailing with them, one bound for Angola, and the other for Mazagnan.

United Provinces. The States open'd their aſſembly, on February the 26th, and the college of the committee of Council, having, with the approbation of her royal highneſs, the princeſs Governante, appointed the ſieur Enekuyſen, to have the principal direction of their Foundry of Cannon, he was accordingly ſworn into that office, on the 24th of February, before their High-mightineſſes.

On February the 25th, the college of the admiralty of Amſterdam, put three men of war into commiſſion: and, on the 26th of the ſame month, the ſtates of Holland, and Weſt-Friezland, open'd their aſſembly. On the ſame day, the marquiſs de Grimaldi, the Spaniſh ambaſſador to their High-mightineſſes, arriv'd at the Hague, with a numerous retinue.

Plantation News.

March 1. They write from *Philadelphia*, of the 12th of Dec. laſt, that the aſſembly had that day ordered a bill to be prepared for granting 20,000l. for the king's uſe.

Alſo unanimouſly reſolved, to defray the charges of thoſe Indians, who have removed from the Ohio, and rejected the offers of the French.

Letters from America adviſe, that the people of Carolina are apprehenſive of the French falling into that colony from the Mobile and Alibamus rivers.

March 4. We learn from Philadelphia, of the 31ſt of Dec. that on the Friday before came to town ſeveral French deſerters, who aſſured, that, in the month of June laſt, there arrived at Quebec, in Canada, ſix men of war with ſeveral thouſands of land forces; many of whom are now at the Ohio, where the French are ſtrengthening themſelves with the utmoſt application.

LONDON.

Mar. 6. EARL Paulet reſigned his place of firſt lord of the bedchamber.

March 8. His grace the duke of Marlborough took the ſacrament at St. Andrew's church, to qualify himſelf for Lord Privy Seal.

11. Lord Cathcart appointed commiſſioner to the general aſſembly at Edinburgh, in the room of the earl of Leven deceaſed.

13. A fire broke out in the tarring-houſe of his majeſty's dock-yard at Plymouth. Admiral Moſtyn alarmed the harbour, and by the aſſiſtance of the ſhip's crews, and the workmen in the yard, it was happily extinguiſhed.

15. The united Eaſt-India company entered at the Cuſtom-houſe, 390,000 ounces of ſilver coin for their factories abroad.

19. A large quantity of money was ſhipped from the Tower for America.

20. His majeſty went to the houſe of peers, and, among others, gave the royal aſſent to the following bills, viz.

For veſting Montague-houſe in truſtees, for the Britiſh Muſeum, for a general repoſitory.——For preventing the holding of any market in the High-ſtreet in the Borough of Southwark.——For eſtabliſhing a Ferry acroſs the Thames, from Ratcliff to Rotherhith.——For enlightening the ſtreets, &c. of St. Bartholomew the Great, in the City of London.—For enlightening the ſtreets, eſtabliſhing a watch, &c. in the city of Briſtol. And, likewiſe for allowing further time for the enrollment of deeds and wills made by Papiſts.

A Regiſter *of* THEATRICAL ENTERTAINMENTS.

	Drury-Lane.	Covent-Garden.
Feb 20.	*The Fairies.*	*The mourning Bride.* —— *Orpheus.*
22.	*Meaſure for meaſure.* —— *Proteus.*	*Mourning Bride.* —— *Orpheus.*
24.	*The Fairies.*	*The Earl of Eſſex.*
25.	*Creuſa.* —— *Lethe.*	*The Rehearſal.* —— *Orpheus.*
27.	*Meaſure for Meaſure.* —— *Proteus.*	*The Earl of Eſſex.* —— *Orpheus.*
Mar. 1.	*Creuſa.* —— *Duke and no Duke.*	*The mourning Bride.* —— *Orpheus.*
3.	*The Fairies.*	*Hamlet.* —— *Orpheus.*
4.	*King Lear.*	*The Way of the World.* —— *Orpheus.*
6.	*Mackbeth.* —— *Anatomiſt.*	*Appius.* A new Tragedy.
8.	*Phædra and Hippolitus.*——*Proteus.*	*Appius.*
10.	*The Fairies.*	*Appius.*
11.	*King Lear.* —— *Lying Valet.*	*Appius.*
12.	*Abel.* —— *An Oratorio.*	*Judas Maccabæus.* An Oratorio.
13.	*The Miſtake.*—*Engliſhman in Paris.*	*Appius*—*Orpheus.*
14.	*Abel.* *An Oratorio.*	*Judas Maccabæus.* *An Oratorio.*
15.	*Venice preſerv'd.*—*Intriguing chambermaid.*	*Appius.*
17.	*Every man in his humour.*—*London Prentice.*	*The Conſtant Couple.*—*Scapin.*
18.	*Tancred.*—*Lethe.*	*Alzira* — *and Taſte.*
19.	*Alfred.* *An Oratorio.*	*Meſſiah.* *An Oratorio.*

BIRTHS.

Feb. 22. The lady of the right hon. the lord Abergavenny, deliver'd of a ſon and heir.

24. The right hon. the lady viſcounteſs Parker, deliver'd of a ſon and heir.

MARRIAGES.

Feb. 17. The hon. Mr. Bateman, brother to the right hon. lord viſcount Bateman, and nephew to his grace the duke of Marlborough, to miſs Hedges.

18. Captain Barragon, of general Wolf's regiment, to miſs Faſſel.

24. Mr. Thomas Pilcher, purſer of his majeſty's ſhip, the Prince, to miſs Towler, a lady of great fortune.

March 5. Iſaac Buxton, oil-merchant, to miſs Fowell.

6. George Taſburgh, Eſq; of Norfolk, to the hon. miſs Tereſa Gage, a lady of 20,000 l. fortune.

13. Captain Matthew Floyer, to miſs Wightwick.

DEATHS.

Feb. 19. Mr. Benham, one of the commiſſioners of the court of requeſts.

Mr. Pegg, another commiſſioner of the ſame court.

21. Her grace, the dutcheſs of Mancheſter.

John Flower, Eſq.

22. Maurice Johnſon, Eſq; of Lincolnſhire, counſellor at law.

23. John Bance, Eſq; formerly a director of the Eaſt India company, and ſince, one of the directors of the bank of England.

24. Mrs. Ann Buck, a widow lady of great fortune.

Lady Bridget Williams, widow of the late rev. Mr. Williams, one of the daughters of the duke of Ancaſter.

25. Aaron Levi, many years, keeper of Woodſtreet compter.

26. Mrs. Lethiullier, lady of William Lethiullier, Eſq; one of the daughers of ſir John Taſh.

March 1. Dr. GeorgePaul, his majeſty's advocate gen. &c. &c.

3. The rev. Mr. Ralph, rector of Ingateſton, Eſſex.

6. Dr. Mangey, golden prebend of Durham, and rector of St. Midreds, Bread-ſtreet.

7. The right rev. Dr. Thomas Wilſon, biſhop of Sodor and Man.

13. Francis Manning, Eſq; formerly reſident at Bern.

Civil

Civil and Military Preferments.

March. 2. Earl of Rochford, appointed by his Majeſty, groom of the Stole, in the room of the late hon. Earle of Albemarle.

8. Francis Atkinſon, of Lancaſter, Eſq; appointed one of the maſters extraordinary of the high court of Chancery.

March 18. The King has been pleaſed to conſtitute and appoint.

John Murray, Eſq; commonly called, John Lord Murray — The right hon. John Earl Loudoun — Maurice Bockland, Eſq; — The right hon. William, Earl of Penmure — George Beauclerk, Eſq; commonly call'd, Lord George Beauclerk — William Herbert, Eſq; — George Sackville, Eſq; commonly called, Lord George Sackville — Wm. Kerr, Eſq; commonly called, Earl of Ancram — William Stanhope, Eſq; commonly called, Lord Viſcount Peterſham — Hugh Warburton, Eſq; — William Shirley, Eſq; — Sir Wm. Pepperel, Bart. — His grace, John duke of Bedford — Cuthbert Elliſon, Eſq; — His grace Peregrine, duke of Ancaſter — His grace Evelyn, duke of Kingſton — John Manners, Eſq; commonly called, Marquiſs of Granby — The right hon. George, Earl of Cholmondeley — The right hon. George Dunk, Earl of Halifax — The right hon. Hugh, viſcount Falmouth — The right hon. Simon, earl of Harcourt — The right hon. Henry Authur, earl of Powys — The right hon. Richard lord Edgcombe — The right hon. John, earl of Sandwich — The right hon. William earl of Home ———— To be major generals of all his majeſty's forces.

ECCLESIASTICAL PREFERMENTS.

The rev. John Sampſon, M. A. appointed domeſtic chaplain to the right hon. Harry duke of Bolton.

The rev. Hen. Gower preſented to the rectory of St. Mary, in the iſle of Ely.

The rev. Henry Harcourt, appointed domeſtic chaplain to the right hon. Simon, earl of Harcourt, one of his majeſty's hon. privy council.

The rev. mr. Jeffries, to the vicarage of Ringland in Norfolk.

The rev. mr. Zac. Sugar, M. A. appointed domeſtic chaplain to the right hon. ducheſs dowager of Gordon, Scotland.

The rev. Richard Hawkins, B. L. to the rectory of Newton Burſhel, in Shropſhire.

The rev. mr. Samuel How, appointed domeſtic chaplain to the right hon. Anne, counteſs dowager of Albemarle.

The rev. Sam. Richards, M. A. to the rectory of Leuden, Pembrokeſhire.

The rev. Joſeph Fox, appointed domeſtic chaplain to the lord biſhop of St. David's.

The rev. mr. Smith, to the rectory of Theydon Mount, Eſſex.

The rev. Tho. Lane, B. A. to the vicarage of Broadwater, Lincolnſhire, worth 120l. per ann.

The rev. G. Woodward, collated by the lord biſhop of Saliſbury, to the prebend of Stratton in that church, vacant by the death of Dr. Wynne, late Canon of the ſaid Cathedral.

The rev. John Joyce, B. L. to the rectory of St. Mary, in the dioceſe of Wincheſter.

The rev. Wm. Foſter, M. A. appointed domeſtic chaplain to the right hon. earl of Strathmore, in Scotland.

The rev. mr. Moor, choſen head maſter of the grammar-ſchool at Leeds in Yorkſhire.

The rev. mr. Henry Hewgill, to the rectory of Smeaton in Yorkſhire.

DISPENSATIONS *to hold two livings.*

Feb. 19. The rev. mr. Wm. Smith, B. L. preſented to the rectory of Stapleford Tawney, Eſſex; with the rectory of Theydon Mount in the ſame county, worth 270l. per ann.

The rev. Peter Petit, M. A. to the vicarage of Royſton, Hertfordſhire; with the vicarage of Sawbridge, in the ſame county, worth 250l. per annum.

Feb. 24. The rev. Tho. Pickering, M. A. to the rectory of Southchurch, Eſſex, with the vicarage of Northweald, otherwiſe Northweald Baſſet, in the ſame county, worth upwards of 300l. per ann.

March 8. The rev. Zac. Sugar, M. A. to the rectory of Barnolby Lebeck, Lincolnſh. with the rectory of Hotham, in Yorkſhire, worth upwards of 270l per ann.

March 15. The rev. Tho. Rock, to the rectory of Bitterley in Shropſhire, with the vicarage of Tenbury, and chapel of Rochford thereto annexed, in Worceſterſhire, worth upwards of 300l. per ann.

The rev. Sam. How to the rectory of Weſt Hanningfield, Eſſex, and to the rectory of South Hanningfield, in the ſame county, worth 270l. per annum.

BILL *of Mortality from* Feb. 18. *to* Mar. 18.

Buried			Chriſtened		
Males	942	1864	Males	616	1149
Females	922		Females	533	
Under 2 years old	636				
Between 2 and 5	150		Buried,		
5 and 10 —	51		Within the walls	168	
10 and 20 —	46		Without	456	
20 and 30 —	146		*Mid.* and *Surry*	814	
30 and 40 —	161		City & Sub. *Weſt.*	426	
40 and 50 —	200				
50 and 60 —	172			1864	
60 and 70 —	130				
70 and 80 —	106		Weekly *Feb.* 25.	468	
80 and 90 —	59		*Mar.* 4.	474	
90 and 100 —	7		11.	460	
100 and 109 —	0		18.	462	
	1864			1864	

B——KR——TS.

Feb.25. Jonathan Weſton, of Briſtol, vint.
Mar.1. Thomas Lyon, of London, watch-m.
Henry Cooper and Thomas Paine, of London, Hardwaremen.
John Roberts, of Petworth in Suſſex, Innkeeper.
James Graham, of Middle-Row, Holborn, Cheeſemonger.
John Roberts, late of Petworth, Innkeeper.
4. Thomas Sayſe, of Glouceſterſh. malſter.
William Garner, of the Old Artillery-Ground, butcher.
James Pointer, of Rotherhith, anchor-ſmith.
Henry Blaine, of Huntingdon, malſter.
Thomas Church, of Norfolk, upholſterer.
Thomas Farrer, of Norfolk, Linnen-draper.
8. J. Gronous and W. Carter, of Craven-Buildings, taylors.
John Battiſon, of Nottinghamſh. and Thomas Taylor, late of London, hoſiers.
Edward Cleaver, of London, victualler.
11. John Smith and John Ruſſel, of Surry, leather-dreſſers.
Jacob Valk, of London, merchant.
Nathaniel Studd, of Suffolk, ſhopkeeper.
Richard Copland, of Norf. worſted-weaver.
15 Joan Dyke, of Taunton, widow, ironm.
18. Edward Long, of Yorkſhire, clothier.
William Beammand and Robert Readhead, of Middleſex, taylors.
22. John Berckenhout, of Leeds, merchant.

BOOKS publiſhed ſince our laſt.

APPIUS, a tragedy. 1s. 6d. *Millar*. (See p. 26 and 27 in our poetry.

—Tho' it is not our province, neither is it any article of our plan, to take any farther notice of books, or pamphlets, than their titles; yet we ſhall take the liberty, now and then, as occaſion offers, to make our curſory remarks. — And in regard to this play, we hope a ſhort account of the ſubject-matter, will be thought not improper.

Appius Claudius, the chief character of the play, was the ſon of *Appius Claudius*, or *Clauſus*, who was born at *Regellum*, a city of the *Sabines*, and becauſe he diſſuaded his countrymen from entering into a war with the *Romans*, was conſtrained to retire to *Rome*, where he was received into the number of the ſenators, and changing his name of *Clauſus* into *Claudius*, became the head of the *Claudian* family, which was afterwards remarkably illuſtrious.

Appius Claudius, here ſpoken of, had neither the virtues, nor merits of his father; for abandoning himſelf to his luſt, he committed thoſe crimes for which he juſtly loſt both his life and his honour.

Upon the change of the Conſular government he was made one of the Decemviri, who had the abſolute authority of the Conſuls; and during the time he was poſſeſſed of that high poſt, he fell in love with *Virginia*, the daughter of *Lucius Virginius* (a military tribune) related to one *Lucius Icilius*, who had been a tribune of the people; but not being able to accompliſh his ends by the fair means of adulations, and rich preſents, he ſuborn'd one *M. Claudius*, to demand the virgin as his fugitive-ſlave, born in the houſe of one of his bond-ſlaves, who had ſold her to the wife of *Virginius*.

The ſuit coming before him, he adjudged *Virginia* to *Claudius*, who carried her away by force; upon which, *Virginius*, ſeeing his daughter dragged into captivity, ſtabbed her to the heart.

Theſe violences occaſioned tumults, the effects of which were, that the Decemviri were pulled down, and the Conſuls reſtored.

Appius was accuſed for his injuſtice to *Virginius*, and committed to priſon, where, for fear of a worſe puniſhment, he was his own executioner, by voluntarily taking a large doſe of poiſon.

Explanation of this years Oxford Almanac, 6d. *Crowder*.

Ellis's Natural Hiſtory of Corals, &c. 12s. 6d. ſew'd. *Millar*.

—This is a piece, which, we imagine, claims the attention of the curious. And as we ſhall have occaſion in the proſecution of our natural hiſtory, to ſpeak of Foſſils, it is highly probable, we may take the liberty to tranſcribe ſome of it; but then we ſhall aſſume no merit to ourſelves, from any ſuch extract; but in that, as in all other caſes of the like nature, we ſhall endeavour to do our authors juſtice, and ingenuouſly acknowledge to whom we are indebted for our literary amuſements.

Fielding's Journal of a voyage to Liſbon, 3s. *Millar*.

Heiſter Dr. his medical, chirurgical, and anatomical caſes and obſervations, 1l. 1s. *Hitch*, &c. 4to.

Hiſtory of the marquiſe Fratteaux, 3s. *G. Woodfall*.

Letter to the Rev. Tho. Jones, 6d. *Collyer*.

——— To the author of conſiderations on the marriage-act, 1s. 6d. *Hawkins*.

Letters (four) on the ſtudy of the Hebrew ſcriptures, 1s. *Withers*.

The laſt blow, or, an unanſwerable anſwer to the vice chancellor of Oxford, Dr. King, &c. 1s. *Crowder*.

Matrimonial Preceptor, 3s. *J. Payne*.

Rival Mother, a novel, 6s. *Noble*.

EACH DAY's *Price of* STOCKS, *in* MARCH 1755. ☞ Books ſhut, is ſignified thus, ———

Days	Bank Stock.	E.-India	South Sea	S. Sea old An. 1ſt Su	S. Sea old A. 2d Sub.	S. Sea An. new 1ſt S.	S. Sea An. 2d Subſc.	3½ Ba. An 1ſt Subſc.	3½ Ba. An 2d Subſc.	3½ *per* C. India An.	3 *per* Cent India An.	Ba. 3 *per* Cents.	3 *per* Cent An. 1751.	India Bon præm.	B. Cir. *per* *l. s. d.*	Wind at *Deal.*	Days
25	130¾a131	176a177½	113a¾a½	102¾	100¾	100¼	101¼	102⅜a¼	101a100⅞	100⅛a¼	100a99⅞	101⅛	100⅜a½	62s a 03	1 2 6	E b N	25
26	131	177¼a½	114	Do	101	Do	100	102⅜a½	No Price.	100¼a⅛	100	100⅞	100⅜	Do	Do	E N E	26
27	130¾a131	177¾a178	No Price.	102⅝	No Price.	101	No Price.	102⅛a102	100⅝	100¼	Do	100¼	100a99¾	Do	Do	N E	27
28	130½	177	113a½	102½	Do	Do	Do	101⅞	No Price.	100	99¾	Do	No Price.	63s	Do	N E	28
1	No Price.	No Price.	No Price.	Do	Do	100⅞	Do	101a100¾	Do	99⅞	No Price.	100¼a100	100⅝	60s	0 17 6	W b N	1
2	Sunday															N W	2
3	No Price.	No Price.	112⅛	102	No Price.	No Price.	No Price.	101⅛a101	No Price.	99	99⅞a⅛	99¼	99½	60s a 58	1 0 0	N	3
4	130½a130	176a175¾	No Price.	102a101¾	Do	100⅛a100	Do	100⅞	99½	Do	98¼a⅛	99½a⅝	99½a¼	57s a 58	1 0 0	S W	4
5	129⅞	175½	Do	101½	99¾	100a⅛	99	100⅞a¾	99⅝	98¾	98¾	99⅝	99½	57s a 55	No Price.	Do	5
6	129½	175¾	Do	101⅝	No Price	100	No Price.	Do	99¾	99½	98½	99⅞a99	99½	55s	1 0 0	W S W	6
7	129¼a129	———	Do	101a100¾	Do	No Price.	Do	100¼a⅛	No Price.	98⅞a⅛	98¼	99⅛a99	No Price.	54s a 52	0 17 6	N E	7
8	No Price.	———	Do	No Price.	98⅞	Do	98	100a⅛	98⅞a99	———	97¾a½	98¼	98¼	50s a 52	No Price.	N b E	8
9	Sunday															N	9
10	128¾a¼	———	No Price.	100½	No Price.	99	No Price.	99¼	No Price.	———	No Price.	No Price.	98½a¼	26s	Par.	N W b N	10
11	128½a128	———	Do	99½a¼	Do	98¼a⅛	Do	99⅞a99⅝	97¾a98	———	———	97¼a98	No Price.	27s a 26	Par.	N N W	11
12	128	———	110½a110	99½	97½a⅜	98⅜	97⅛	99a98⅞	No Price.	———	———	97½a⅝	97¼	32s a 33	0 10 0	E b N	12
13	128	———	No Price.	Do	No Price.	97⅞a98	No Price.	98⅞a99	97⅝a¾	———	———	97⅜a⅞	96⅞a¾	31s	0 7 6	N E b N	13
14	———	———	109½	99¼a½	Do	97¾a⅞	Do	98½a¾	No Price.	———	———	97⅛a¼	96¾	32s a 31	Do	N	14
15	———	———	109¼	99¼	97⅛	98	96¾	98⅝a¾	97⅛	———	———	97a⅛	Do	31s a 32	Do	S	15
16	Sunday															S W b S	16
17	———	———	109¼	99½	No Price.	98	No Price	99a98¾	97½	———	———	97a⅛	96¾	32s a 31	Do	E	17
18	128	———	No Price.	99½a⅝	97½	98⅛	96¾a⅞	———	97½a⅞	———	———	Do	Do	30s a 31	0 10 0	N b E	18
19	127¾	———	109¾	———	97⅝	Do	96⅞a97	———	———	———	———	97¼	96¾a97	Do	0 12 6	Do	19
20	———	———	109¾a110	———	———	98⅛a⅜	No Price.	———	———	———	———	97⅜	97⅛a¼	30s a 34	0 15 0	Do	20
21	———	———	102½	———	———	98¼a⅛	97¼a⅛	———	———	———	———	97½a⅝	97¼	33s a 34	0 17 6	W S W	21
22	———	———	No Price.	———	———	98⅜a99	97½a⅞	———	———	———	———	97⅝a¾	97⅛a¼	35s a 37	1 0 0	Do	22
23	Sunday															S W	23
24	———	———	112¼	———	———	99¾a100¼	99	———	———	———	———	98⅝a99	98⅛a99	37s a 40	1 0 0	Do	24

Prices Corn.	Mark-Lane.	Baſingſtoke.	Reading.	Farnham.	Henley.	Guildford.	Warminſter.	Devizes.	Glouceſter.	London.
Wheat	23s to 26s qr.	110s to 135s l.	6l 10s to 8l 8s l.	107s to 145 load	6l 10 to 8l 5 lo.	130s to 160 lo.	27s to 34s qr.	25s to 32s qr.	5s od buſh.	W. Pec. Loaf 20d
Barley	13s to 14s od	13s to 14s qr.	14s to 18s 3d qr	14s to 4s 6d qr.	15s to 17s qr.	14s to 16s od qr	13s to 16s	12s to 15s	2s to 2s 4d	
Oats	12s to 13s 6d	13s to 14s 6d	14s to 20s od	13s 9d to 15s	14s to 17s. 6d	12s 6d to 16s	11s to 13s	12s to 14s	1s 6d to 8d	
Beans	17s to 18s od	19s to 22s od	19s to 23s od	21s to 21s 6d	19s to 22s 6d	22s to 24s	23s to 27s	22s to 25s	2s 8d to 3s	

Miſcellaneous Correſpondence,

For *APRIL*, 1755.

The ESSAY on the *Uſefulneſs* of MATHEMATICAL LEARNING, *continued from Page* 38 *of our laſt.*

The uſefulneſs of *mathematics* in ſeveral other arts and ſciences, is fully as plain. Every body knows, that *chronology* and *geography* are indiſpenſible preparations for hiſtory: a relation of a matter of fact being very imperfect, without the circumſtances of time and place. To have a true idea of any city, or country, we ought to know the relation it bears to any other place, its climate, heat, cold, length of days, *&c.*

Nobody, I think, will queſtion the intereſt that *mathematics* have in *painting*, *muſic* and *architecture*. With reſpect to *painting*, perſpective, and the rules of lights and ſhadows, are owing to *geometry* and *optics*. If *mathematics* had not reduced *muſic* to a regular ſyſtem, it had been no art, but enthuſiaſtic rapture, left to the roving fancy of every practitioner. This appears by the extraordinary pains taken by the antients to fit numbers to the three ſorts of muſic, the *diatonic*, *chromatic*, and *enharmonic*: but *muſic* had been ſtill imperfect, had not arithmetic ſtepped in once more, and *Guido Aretinus*, by inventing the temperament, and making the fifth falſe, by a certain determined quantity, taught us to intermix all the three kinds of the antients, to which we owe all the regular and noble harmony of our modern *muſic*. As for civil architecture, there is hardly any part of *mathematics*, but is ſome way ſubſervient to it: *geometry* and *arithmetic*, for the due meaſure of a building; for plans, models, computation of materials, time and charges; for ordering right its arches and vaults, that they may be both firm and beautiful: *mechanics*, for its ſtrength and firmneſs, tranſporting and raiſing materials; and optics for the ſymetry and beauty of the whole. It muſt, however, be owned, that he, that ſhould pretend to *draw*, without any other knowledge of the art, but the geometrical rules of perſpective; or compoſe muſic merely by his ſkill in harmonical numbers, would produce very aukward performances. Since all theſe arts, beſides the ſtiffneſs of rules, require fancy, genius, and habit. Yet, nevertheleſs, theſe arts owe their being to mathematics, as laying the foundation of their theory, and affording them precepts, which, being once invented, are ſecurely relied on by the artiſt.

I proceed now, to ſhew the more immediate uſefulneſs of *mathematics* in *civil affairs*. To begin with *arithmetic*, it would be an endleſs taſk to relate its ſeveral uſes in public and private buſineſs. If we ſhould feel the want of it in the eaſieſt calculations, how much more ſhould we do it in thoſe that are ſomething harder; as intereſt, ſimple and compound, annuities, *&c.* in which it is incredible, how much the ordinary rules and tables influence the diſpatch of buſineſs. *Arithmetic* is not only the great inſtrument of private commerce; but by it are, or ought to be, kept the public accounts of a nation, in regard to the number, and fruitfulneſs of its people, the increaſe of ſtock, and the improvement of lands and manufactures; the balance of trade, public revenues, coinage, military power by ſea and land, &c. In ſhort, numbers are applicable even to ſuch things as ſeem to be governed by no rule; I mean ſuch as depend on chance: in which the degree of probability, and its proportion in any two propoſed caſes, is as much a ſubject of calculation, as any thing elſe.

The ſeveral Uſes of *geometry* are not much fewer than thoſe of *arithmetic*. It is neceſſary for meaſuring diſtances, laying down plans and maps of countries; for aſcertaining of property both in plains and ſolids, or in ſurveying and gauging. By the help of this ſcience, land is ſold by the meaſure, as well as cloth: workmen are paid the due price of their labour, according to the ſuperficial or ſolid meaſure of their work: and the quantity of liquors determined, for a due regulation of their price and duty.

From *aſtronomy* we have the regular diſpoſition of our time, in a due ſucceſſion of years, which are kept within their limits, as to the return of the ſeaſons, and the motion of the ſun. This is of no ſmall advantage in our public, private, military, and country affairs. The adjuſting of the moon's motion to that of the Sun is required for the celebration of the *church-feaſts* and *faſts*, according to the antient cuſtom and primitive inſtitution; and likewiſe for knowing the ebbing and flowing of the tides, the ſpring and neap tides, currents, &c. Beſides, without a regular chronology, there can be no certain hiſtory.

Mechanics have produced ſo many uſeful engines, that it would be a taſk too great to relate the ſeveral ſorts of them. If we conſider ſuch as are invented for raiſing weights, and are employed in building and other great works, in which no impediment is too great for them; or *hydraulic* engines for raiſing water; or ſuch as by making wind and water perform works which would require a great number of hands; or thoſe invented by mankind to give delight by imitating the motions of animals, &c. we ſhall have reaſon to extol ſo excellent an art. How admirable are thoſe invented to meaſure time, as *clocks*, *watches*, *ſun-dials*, &c. or thoſe for aſcertaining the changes in the air, as *barometers*, *thermometers*, &c. To this ſort of engines ought to be referred ſpheres, globes, aſtrolabes, projections of the ſphere, the orrery, &c. by which we are able in our cloſets to judge of the celeſtial motions, and to viſit the moſt diſtant parts of the earth, without the fatigue and danger of voyages; to determine their diſtances, ſituations, and climates; the nature of their ſeaſons, the length of their days, and their relation to the celeſtial bodies. To theſe may be added thoſe inſtruments invented by mathematicians for the execution of their own precepts, for making obſervations either at ſea or land, ſurveying, gauging, &c.

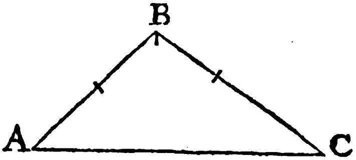
Catoptrics and *dioptrics* furniſh us with variety of inventions, by which ſight, the great inſtrument of our perception is ſo much improved, that neither the diſtance nor the minuteneſs of the object are any more impediments to it: they have produced a heat inimitable by our hotteſt furnaces, and have furniſhed infallible, eaſy, cheap, and ſafe remedies for the decay of ſight, commonly ariſing from old age, and for pur-blindneſs.

Again, *mathematics* are highly ſerviceable to a nation in *military affairs*, which take in number, ſpace, force, diſtance, time, &c. as in *tactics*, *caſtramation*, *fortifying*, *attacking*, and *defending*. The modern method of fortification is built on geometry, by which the lines and angles of a fortification, that contribute moſt to its ſtrength, are determined. But there

(To be concluded in our next.)

MATHEMATICAL QUESTIONS Anſwered.

Queſtion 3. *Anſwered by* P. N. *of* Briſtol.



PUT $x =$ Sine of the leſſer Angle at Baſe = ſine of Angle A, $a =$ leſſer ſide = A B = 20, $b =$ greater ſide = 25 = B C, $m =$ ſine of the included Angle B = 110° = ſine 70°, n & $u =$ ſine and coſine of its Sup. to 180° = ſine and coſine of 70°, then $x : a :: m : \frac{am}{x} =$ baſe = A C. But, $1 : a :: n : an$, and $1 : a :: u : au$, and $\sqrt{\overline{b+au}|^2 + \overline{an}|^2} = \frac{am}{x}$. Reduced, $\frac{\overline{am}|^2}{\overline{b+au}|^2 + \overline{au}^2} = x^2$ hence $x =$ ſine 30° 32′ and the Baſe 37.

The ſame Anſwered by T. L.

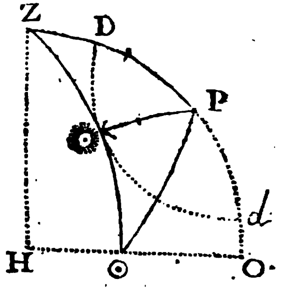
IN any plain triangle, put p and $q =$ ſine and coſine of half ſum of the angles at baſe, *i. e.* A and C, and the tangent of the ſaid half ſum will be $\frac{p}{q}$, let $x =$ ſine of half difference of the angles at the baſe, then $\sqrt{1-x^2}$ will be the coſine, and $\frac{x}{\sqrt{1-x^2}} =$ the tangent of the ſaid half difference, put $s =$ ſum of the ſides, and $d =$ difference of the ſides, then $s : d :: \frac{p}{q} : \frac{dp}{sq} = \frac{x}{\sqrt{1-x^2}}$, which reduced, &c. gives $x^2 = \frac{dp}{s^2p^2 \pm d^2p^2}$, hence $x = 4° \ 28'$, the greater angle 39° 28′, the leſſer angle 30° 32′, and the baſe 37.

The ſame Anſwered by Tycho.

PUT $25+20=45=s$, $25-20=5=d$, $p =$ ſine of half ſum of the angles at baſe = ſine of 35°, and q its coſine, and $t =$ tangent of half the ſum of the angles at baſe. By the common theorem $s : d :: t : \frac{dt}{s} =$ tangent of half difference of the angles at baſe, whoſe ſecant is $\sqrt{1+\overline{\frac{td}{s}}|^2}$, and its coſine $\frac{1}{\sqrt{1+\overline{\frac{td}{s}}|^2}}$. But $t = \frac{p}{q}$ which written for t gives $\frac{1}{\sqrt{1+\overline{\frac{pd}{qs}}|^2}} =$ coſine of half difference of the angle at baſe, from which theorem the parts required are determined as above.

Being informed, by the Propoſer, that this queſtion was not ſo much to exerciſe the genius, as to procure (if poſſible,) an eaſy theorem for ſolving the caſe in plain trigonometry with ſines only. If ſuch ſhould be hereafter communicated to us, it ſhall be duly inſerted in our magazine.

Queſt. 4. *Anſwered* By Mr. DUNN.



PRoject the ſphere ſtereographically on the plane of the meridian of the place of obſervation H Z O, draw the parallel of declination D ✱ *d*, and let down the quadrant Z ⊙ touching D ✱ *d* in ✱, and draw P ✱ the Sun's diſtance from the pole, then becauſe P ✱ is the neareſt diſtance to Z ⊙, the angle Z ✱ P will = 90° = angle ⊙ ✱ P. Here are given ✱ P = 67° 56′, Z P = 85° and angle Z ✱ P = 90°. To find the greateſt azimuth, ſay, as coſine of the latitude : radius : : ſine of the Sun's diſtance from the pole : ſine of the greateſt azimuth, and when D *d* cuts the horizon H ⊙ to find the amplitude ſay, as coſine of latitude : ſine of the declination : : radius : ſine of the amplitude.

OPERATION.

Coſine 5° 0′	Co. ar. 0.001656	Co. ſine 5° 0′	Co. ar. 0.001656
Rad. 90° 0′	10.	Sine 22° 4′	9.574824
Sine 67° 56′	9.966961	Rad. 90°	10
Sine 68° 29′	9.968617	Coſine 67° 51′	9.576480

Hence the amplitude was 67° 51′, the greateſt azimuth 68° 29′, and the leaſt azimuth 0° 0′, from the north, reſpectively.

COROLLARY.

☞ *HEnce we have a new, eaſy, and correct method, for finding the variation of the magnetic needle, and alſo the latitude of a place, without the help of any altitude inſtrument whatſoever.*

EXAMPLE.

LET D ✱ *d* repreſent the parallel of declination of any phænomenon, *viz.* the ſun, moon, a planet, fix'd ſtar of the firſt magnitude, *&c.* whoſe declination is greater than the latitude of the place of obſervation, and is alſo known by ſome ephemerides or table of the ſun's place, moon's place, planets, ſtars places, *&c.* From Z the zenith let down the quadrant Z ⊙ to touch the parallel of declination in ✱, the angle Z ✱ P will be a right angle, and the angle ✱ Z P the greateſt azimuth that ſuch a phænomenon can make in that latitude. Both before and after the phænomenon is on the meridian, let this greateſt azimuth be very carefully taken †, the horizontal middle of theſe two obſervations will be the true meridian, and ſhews the variation of the needle required. If the time between theſe two obſervations be thought too long, an obſervation may be made at the riſing or ſetting, and another,

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† *This gentleman hath alſo favoured us with the deſcription and uſe of a new azimuth compaſs (invented (he ſays) by* Gowen Knight, M. D. & F. R. S. *and made by an artiſt, but little known, who, for accuracy, is exceeded by none, Mr.* John Morgan, *mathematical inſtrument-maker in* London) *which is applicable to ſurveying and other parts of practical mathematics, and particularly navigation. We ſhall publiſh it in ſome future number.*

another at the greateſt azimuth, and the ſolution of a ſpheric triangle will anſwer the ſame end.

Having the variation of the needle, there are given, the greateſt azimuth, *viz.* the angle ✱ Z P, the co-declination ✱ P, and the angle Z ✱ P a right angle, from whence the co-latitude Z P is eaſily determined, *i. e.* as the ſine of the greateſt azimuth : to the ſine of the co-declination : : ſo is radius : to the coſine of the latitude.

General SCHOLIUM.

This property, not taken notice of in any treatiſe of the ſphere or public mathematical correſpondence, admits a very great variety of practical problems entirely new, which may be compounded and formed as the mathematician ſhall think fit.

Threadneedle-ſtreet,
13th *March,* 1755.

MATHEMATICAL QUESTIONS to be anſwered.

Queſtion 11. By ASTRONOMICUS.

THE firſt of *December,* 1754, in the evening, at Sea, in 2° N. Lat. the amplitude of the Moon was taken at riſing 70°, and the ſame evening her greateſt azimuth from the North, was obſerved 72°. Required, the variation of the needle?

Queſt. 12. By Mr. JOHN ASH.

ON the firſt of *April,* 1754 (declination 4° 37′ N.) the Sun came due Eaſt 38 minutes after his riſing. *Quære* the Lat. of the place of obſervation?

Queſt. 13. By a Wheelwright.

THE ſpokes of cart and waggon wheels being placed not perpendicular to their axes, leſt the carriage ſhould overturn in roads which are not horizontal from ſide to ſide; under what angle, with the perpendicular to the horizon, muſt I fix the ſpoke, to diminiſh its ſtrength thereby but $\frac{1}{10}$ when the carriage is on an horizontal plane?

Queſt. 14. By W. F. of *Chatham.*

I Have a right cone which coſt me 5*l.* 13*s.* 7*d.* at 10*s.* per foot ſolid, its diameter at baſe being $\frac{5}{8}$ of its altitude; I would have its convex ſurface divided in the ſame ratio by a plane parallel to its baſe. *Quære,* the ſlant height of each part?

Queſt. 15. By LONDINENSIS.

THE ſide of a rock riſes perpendicularly 30 feet above an horizontal plane, and a ſtream of water is driven over the top of the rock with ſuch a force as to project the water 20 feet from the ſide of the rock on the horizontal plane. *Quære,* the diameter of the greateſt wheel that can be driven in an over-ſhot manner within thoſe limits?

Queſt. 16. By MECHANICUS.

WHICH is the ſtrongeſt, an oak beam of 10 feet long and 1 foot ſquare, or one of the ſame timber 15 feet long and 1 $\frac{1}{2}$ feet ſquare; and what is the difference of their ſtrength?

Queſt.

Queſt. 17. By Mr. JOHN SHIPMAN of *Hull.*

A Ship ſailed from Lat. 53° 40′ N. on a certain courſe, between north and eaſt, until her departure was 84 miles; and after ſailing 34 miles more upon the ſame courſe, ſhe was in Lat. 55° 20′ N. Required her courſe and diſtance run, without algebra?

Queſt. 18. By L. T.

IF the altitude of a ſugar loaf be 20 inches, and the diameter of its baſe 16 inches; quære the dimenſions of each part when it is cut by a plane parallel to its altitude, ſo that the weight of the greater part is $\frac{3}{2}$ of the leſſer?

Queſt. 19. By L. B.

IN Lat. 51° 32′ N. ſtand two pillars S. W. and N. E. of one another at the diſtance of 200 feet, the height of the ſouthermoſt pillar is 60 feet, and that of the northermoſt 40 feet. At what time of day on *June* 20th 1755, will the ſhadows of their ſummits approach the neareſt to each other?

Queſt. 20. By X. Z.

THE top diameter of a ſilver cup (in form of the fruſtum of a cone) is 3 inches, its bottom diameter 4 inches, and altitude 6 inches, being fill'd with liquor, a perſon drank until he could ſee the middle of the bottom. Quære what was left?

Obſervations on the Weather.

	Mar.	Barometer.	Therm.	Pluviameter.
	21	29 : $6\frac{1}{4}$	$19\frac{3}{4}$	0 : 0
	22	29 : 5	20	0 : 9
	23	29 : 6	21	21 : 1
	24	29 : $4\frac{3}{4}$	21	20 : 3
	25	29 : 6	21	4 : 5
	26	29 : 8	24	15 : 2
	27	29 : $9\frac{3}{4}$	$25\frac{1}{2}$	3 : 2
	28	29 : $8\frac{3}{4}$	$25\frac{1}{2}$	0 : 0
	29	30 : 0	25	0 : 0
	30	29 : $9\frac{3}{4}$	25	0 : 0
	31	29 : $7\frac{1}{2}$	$25\frac{1}{2}$	0 : 0
April	1	29 : $8\frac{3}{4}$	$25\frac{1}{2}$	0 : 0
	2	29 : $7\frac{1}{2}$	26	18 : 1
	3	29 : $7\frac{1}{2}$	$25\frac{1}{2}$	10 : 2
	4	29 : $6\frac{3}{4}$	$25\frac{1}{2}$	14 : 8
	5	29 : 4	26	20 : 4
	6	29 : $6\frac{3}{4}$	$23\frac{1}{2}$	9 : 8
	7	29 : 6	$24\frac{1}{4}$	5 : 0
	8	29 : $5\frac{1}{2}$	24	0 : 8
	9	29 : 5	$23\frac{1}{2}$	13 : 0
	10	29 : $8\frac{1}{4}$	$25\frac{1}{2}$	0 : 2
	11	29 : $5\frac{1}{2}$	$27\frac{1}{2}$	0 : 0
	12	29 : $6\frac{1}{2}$	26	7 : 5
	13	30 : 0	26	1 : 2
	14	30 : $0\frac{3}{4}$	$26\frac{1}{2}$	0 : 0
	15	30 : $1\frac{1}{2}$	27	0 : 0
	16	30 : $1\frac{3}{4}$	27	0 : 0
	17	30 : $0\frac{1}{2}$	$27\frac{1}{2}$	0 : 0
	18	30 : $0\frac{1}{2}$	$27\frac{1}{2}$	0 : 0
	19	30 : $0\frac{1}{4}$	$28\frac{1}{2}$	0 : 0
	20	29 : $8\frac{3}{4}$	$32\frac{1}{2}$	0 : 0
	21	29 : $7\frac{1}{2}$	33	0 : 0

A SONG.

CAn'ſt thou, unkind *Roſetta*, doubt
Thy *Strephon*'s ardent love?
Thy every glance muſt ſpy it out,
His every action prove.

When thou'rt in ſight his raviſhed eyes
On thee alone can gaze;
And when he ſpeaks, his treach'rous voice
The latent flame betrays.

His conſcious cheeks, their proof to join,
With warmth, unuſual, glow:
Happy! cou'd they thy breaſt incline
A mutual warmth to know.

The infant paſſion in his breaſt
An eaſy lodging found;
But ſoon, by vig'rous growth encreas'd,
It burſt the native bound.

Since then the love thou did'ſt impart
Can't ſuch confinement bear;
What's now too big for *Strephon*'s heart,
Let thine, *Roſetta*, ſhare.

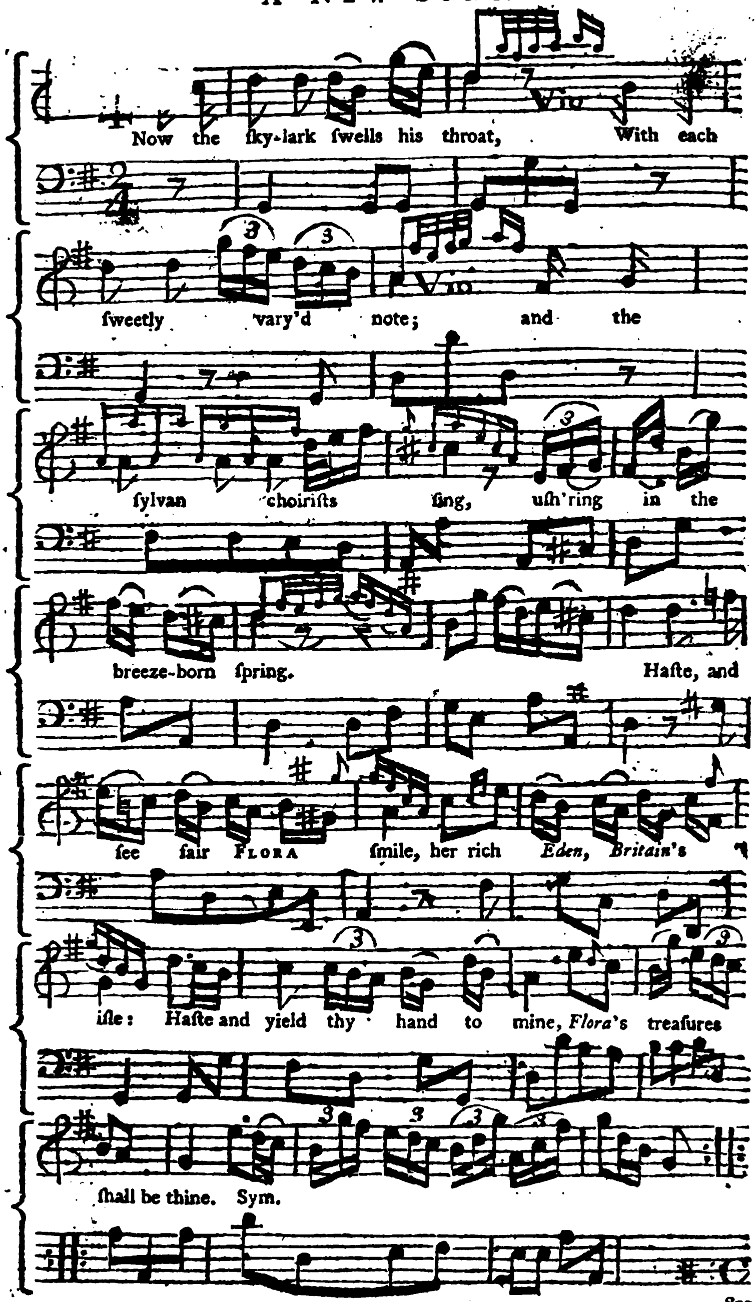
To Mr. DUCK.

On his Poem, called CÆSAR'S CAMP: *Or, St.* GEORGE'S HILL.

TO *Duck*, *Apollo* lent his lyre,
And bad him try his ſkill;
Duck tun'd it, at the God's deſire,
And ſung *St. George's Hill.*

A

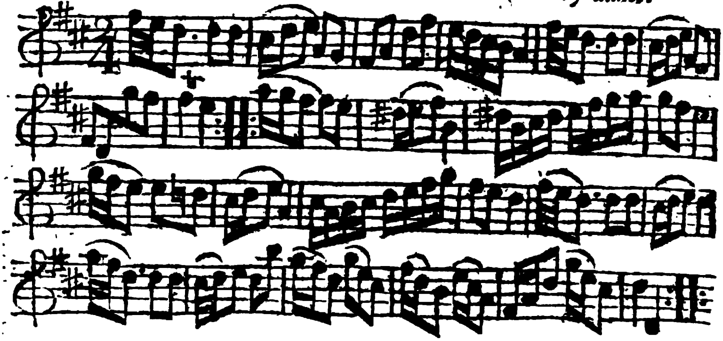
A NEW SONG.


Now the ſky-lark ſwells his throat, With each
Vio
ſweetly vary'd note; and the
Vio
ſylvan choiriſts ſing, uſh'ring in the
breeze-born ſpring. Haſte, and
ſee fair FLORA ſmile, her rich Eden, Britain's
iſle: Haſte and yield thy hand to mine, Flora's treaſures
ſhall be thine. Sym.

See! the little lambkins bound,
Gameſome, o'er the flow'ry ground.
Mild, and innocent, as thee;
Happier far, my maid, than me.
They never felt a lover's pain;
Never met with cold diſdain:
And, like thee, they ſtart away,
When I aſk thee but to ſtay.

Cælia, ſhall my tune
Never gain a lover's
Muſt I throw my pi
And no more reſume
Know, my fair one,
Dignifies the human
Heav'n-born virtue
And ſays, " that lov

Princeſs AUGUSTA's Tamborine. *A Country-dance.*



The 1ſt Couple caſt off two Coup. ∸ Lead up to the Top, and caſt off one Coup. ∸ Lea thro' the Bottom and caſt up, foot it and turn your Partner ∸ Hands ſix round, and Righ Hand and Left ∸

SONG.

" CONtented all day I will ſit by your ſide,
" Where poplars, far ſpreading, o'er-arch the cool tide:
" And while the clear river runs purling along,
" The Lark and the Linnet contend in their ſong;

Perhaps, when the Nightingale opens her throat,
And fills the gay concert in every note;
Or, when Turtles' ſoft murmurs are heard thro' the grove,
You'll ſoften to pity, and liſten to love.

Still ſhould you neglect the diſtreſs of my heart,
And muſic no tender emotions impart;
In queſt of new charms the dull time I'd beguile,
And baſk in the glow of a look or a ſmile.

Kent.

To a married Lady with Dr. WATTS's LYRIC POEMS.

By her Huſband.

INdulge, my fair, the lays thy charms inſpire:
For love, like ours, great *Watts* attun'd his lyre.
Our ſouls firſt rapt in *virtue*'s ſacred cauſe,
He forms us next to *friendſhip*'s gen'rous laws.
How potent *each* in this confed'rate view,
Not leſs than us, *the letter'd poet* knew.
Finiſh'd in *both*, ſtill may we riſe in life;
Nor death, 'till late, diſſolve the noble ſtrife.
Tho', light as chaff, to the looſe, ſportive winds,
It's vows, too oft, the treach'rous heart reſigns;
Yet, in each ſcene, with thy dear form impreſt,
And aw'd by *grace*, which guards the lover beſt:
Herſelf the pole ſhall bright *Sariſſa* be,
And *Lemuel*'s tend'reſt paſſions point to thee.
Others ſhall ſink in thy ſuperior Ray,
As darkneſs flies before the blaze of day.

SONG.

COme, *Lucinda*, nymph divine,
Siſter of the tuneful nine;
Haſte thee to the vocal grove,
Breathing odours, breathing love.

Be thy temples deck'd around,
With a flow'ry chaplet crown'd:
Curling locks o'erſpread thy breaſt,
In a mantle lightly dreſs'd.

On the moſſy bank reclin'd,
Gently wafted by the wind,
Circling Sylvans round thee there
Shall forget their fleecy care.

Phœbus, come, forſake thy choir,
Wond'ring drop the yielding lyre;
If *Lucinda* ſweeps the ſtring,
Raptur'd Syrens ceaſe to ſing.

To *Favonius* be the ſong,
God whom vernal muſes throng;
While the warblers of the ſky,
Swell the chorus as they fly.

Come then, fair one, come away,
Kindly now reſume the lay:
Hear, oh! hear, an artleſs ſwain
Penſive woo thy gentle reign.
Kent, 1741.

OCCASIONAL EPILOGUE to *APPIUS.*

By the AUTHOR.

PLACE antient *Rome* and *Britain* in the ſcale:—
Which would for ſolid liberty, prevail?—
Come; let us fairly poiſe them, if you pleaſe;
'Twill furniſh out an epilogue with eaſe.
Here too the critics will perhaps admit,
That ſuch a ſort of epilogue is fit;
To ſuch a *Roman* ſubject tack'd:—at leaſt
Is fitter than a wanton ill-tim'd jeſt.—
While *Rome* the ſweets of her republic felt,
Within her walls a manly freedom dwelt.
Of virtue, freedom is the ſource and food:
Her ſons were valiant, and their morals good.
Weak in its texture, but in virtue ſtrong;
'Twas thus that her republic laſted long.
From what elſe could (conceive it as we liſt)
Such a frail form of government ſubſiſt?
Soon as the race of royalty was run,
A wild, licentious anarchy begun:
Deep were the roots of diſcord and debate;
For *Rome* was ſplit into a double ſtate:
This way the ſenate, that the people drove;
The rich and few with needy numbers ſtrove;
While equal pow'rs their adverſe leaders crown'd,
Without a prince, to caſt the balance, found.—
Dire was the ſtrife; nor otherwiſe appeas'd,
Than as the virtue of the victors pleas'd.
In *Rome*, when antient virtue ceas'd to dwell,
Forthwith the frame of her republic fell.
The laſt great champions of her rights ill-ſped;
And freedom, with the love of country, fled.—
Be this truth grav'd on her republic's tomb;
It bore the viper, ruin, in its womb.—
Not ſo with *Britain*'s kingly common-wealth;
Her ſource is wiſdom, and her baſis health.
Firm as a rock the noble ſyſtem ſtands;
Faſhion'd by time, and reaſon's ſkilful hands.—
With liberty, not leſs than *Rome*, inſpir'd;
By the ſame ſparks of human diſcord fir'd;
In one well-jointed ſtate, of form compleat,
Commons and peers, pois'd by the ſcepter, meet.—
Mighty the monarch's pow'r on *Britain*'s throne;
As much as heav'n and nature meant to one;
He, ſtrong to bleſs his people, and to ſave;
Only wants pow'r to ruin and enſlave.—
Princes, vain is the pride, the pleaſure low,
Which from an abject, ſervile homage flow.
Would ye grow truly great; look here, and then,
Like *Britain*'s monarch, be the kings of men.
Inſtead of forging foreign fetters, deign
To free your ſubjects, and by reaſon reign.—
How great, how godlike is the king! how bleſt,
Who ſtands the ſhield of liberty confeſt!
Whom princely merit, mercy, juſtice crown;
Who deems the public happineſs his own:
The widow-making ſword who never draws,
Except for freedom and in *Europe*'s cauſe!
Him hail, ye *Britons*. Hail him every land,
Which feels the prop of his imperial hand.
Be this the nation's and the muſes's ſong:—
Live GEORGE, the father of his people, long.

☞ *We have received ſeveral anſwers to the anatomical queſtion in* N°. II. *for which we return our correſpondents thanks; eſpecially* J. W——tt, H. Wood, &c. *which ſhall be inſerted the firſt opportunity.*

A CHRONOLOGICAL MEMOIR *of* OCCURRENCES.

For *APRIL*, 1755.

Barbary.

THE government of Algiers is preparing to ſend a ſhip with preſents for the grand Signior, as uſual, on a new Dey's acceſſion, and to deſire of the Sultan the inveſtiture of the Caſſtan for him; as, till that is ſent the Dey is never looked upon to be abſolutely confirmed in his office, and it is never refuſed by the Porte. The new Dey has publiſhed an edict, forbidding the Moors to wear gold and ſilver upon their cloaths. The Spaniſh miſſionaries for the redemption of ſlaves, left this City, on their return to Cartagena, on the 24th of December laſt, having ſettled the Cartel for the exchange of priſoners. About a month ſince, a Saletine cruiſer, of 18 guns, and 150 men, entered this port with a French prize, and has been allowed to ſell both ſhip and cargo.

The Dey has confirmed and put his ſeal to the peace, and to the additional article made by commodore Keppel, concerning the Engliſh packet boats; but has declared war againſt the Dutch and Imperialiſts.

On the 24th of July laſt, the late Baſhaw of Tripoly departed this life, after a tedious and painful illneſs, about ſix in the evening, and at ſeven, his eldeſt ſon Sidi Ali was inſtalled, and ſat in the chair of ſtate; at ten the ſame evening, he was proclaimed through the city, and early the next morning, the Divan, officers of ſtate, and all ranks of people within, 20 miles of that Capital, paid him their reſpective congratulations; as did likewiſe all the European conſuls; and according to the eaſtern ſtyle, every one carried with him a preſent. This prince is poſſeſſed of the univerſal affection and eſteem of all degrees of people: He is now about 23 years of age, of a very affable preſence and behaviour, temperate, juſt, and an utter enemy to all manner of vice.

On the 7th of October laſt, he renewed and confirmed all former treaties, ſubſiſting between his Britannic Majeſty and the ſtate of Tripoly.

Turkey. The grand Vizir of Conſtantinople is depoſed, and the Janizar Aga is made Caimacan, until another Vizir is named, who, it is expected, will be Aly Paſcha Echim Oglu, for the third time, who ſet out from Tribizonde about the beginning of March laſt, but was detained for ſome time, through the badneſs of the roads.

The Dey has ſent ſeveral Chriſtian ſlaves, blacks, and wild beaſts, as a preſent to the grand Signior, who, in return, has given him ſome cannon and ammunition, and aſſured him of his protection.

Poland. Baron Scarffenſtein, who had reſided at Warſaw for forty four years, in quality of reſident, from their imperial Majeſties, died there in the 73d year of his age, and was buried with great funeral pomp in the church of the convent of the Capuchins.

The ambaſſador, who is coming from Conſtantinople, to notify to the king and republick of Poland, the acceſſion of Oſman III. to the Ottoman Throne, arrived ſome time ago at Dubno, and is daily expected at Warſaw.

The navigation of the Elbe, which had been interrupted for ten weeks by the ice, became free on the 8th of March laſt.

Count Potocki, great cup-bearer to the Crown, is appointed to compliment the new grand Signior, upon his acceſſion to the Ottoman Throne.

Portugal. The fleet bound for the Bay of All-Saints, is already equipped; and that for Maragnan and Para will be ready to put to ſea in a few days.

His Majeſty has ordered the ſum of fourſcore thouſand cruzades to be paid to the religious of the order of Mercy, to enable them to ranſom ſuch of his majeſty's ſubjects who are in ſlavery at Algiers, or elſewhere upon the coaſt of Barbary.

Italy. Mount Veſuvius, about the fourth of March laſt, began to throw out greater quantities of bituminous matter than it did at the preceding eruptions.

About the 16th of February laſt, two Malteſe men of war, having fallen in with three Tuneſian corſairs, off Meſſina, a ſmart engagement enſued, in which, the Malteſe ſunk one of the corſairs, and took the other two. There were 250 Turks on board, whom they carried into ſlavery.

The king's Chebecks are on their cruiſe againſt the Barbary pirates, who greatly interrupt their navigation.

United Provinces. The ſtates of Holland, on the 21ſt of March laſt, were in deliberation upon the reports of the admiralties concerning the affairs of the free port. The government here is expecting farther news from Algiers; as the report of a rupture with the republick differs ſo widely from the accounts of the Dutch conſul there, of the 18th of February laſt, in which he mentions his having renewed the treaty with the new Dey.

On the 15th of this inſtant April, their high mightineſſes reſumed their deliberations. The deputies of the ſeveral Colleges of the admiralty, are taking the neceſſary meaſures to protect the navigation and commerce of this kingdom from the Algerines.

Their high mightineſſes, by an ordonnance lately publiſhed, ſuſpended from the 1ſt of April to the end of May, the prohibition againſt bringing horned cattle into Holland; on condition, nevertheleſs, that all cattle from Denmark, Jutland, or any of the adjacent countries, ſhould be brought only by ſea, and that the neceſſary certificates ſhould be produced, of their being in health, and of their coming from uninfected places.

On the 25th they reaſſumed their deliberations; and the deputies of the ſeveral Colleges of the admiralty meet regularly to conſider of the affairs of their department.

Plantation News. Letters from New-York, dated January 6. ſay, that near 6000 pick'd grenadiers, had lately arrived from France, at the Fort on the Ohio, who were immediately employed in digging mines to blow up the Engliſh in their approaches to attack them; and, that the French threaten they will by force compel the Engliſh Indians to join them.

Extract of a letter from Mr. W. Fr. Phillips, *a volunteer in Sir* Peter Halket'*s regiment, dated from* Hampton Road, Virginia, *7th* March, 1755.

'The Fiſhbone and the Aſgood tranſports arrived here the laſt day of February, after a pleaſant paſſage of ſeven weeks. The convoy and the reſt of the tranſports are not yet come in; however, we can form a body of 200 men, which, with 400 Americans that are to join us, are to go upon immediate action, by attacking Monogaheley Fort. We did not loſe a man in the voyage, except one, who, by accident, fell over-board. We are this day to ſail up the river Patamack, and you will certainly hear of our taking the Fort.'

The aſſembly of north Carolina, have paſs'd a bill for raiſing 8000 l. for aſſiſting the colony of Virginia, againſt the encroachments of the French.

Scotland. The linnen cloth ſtampt here for ſale, from November 1. 1753, to Nov. 1. 1754, amounted to 8,914,369 yards, which was valued at 506,816 l. 18 s.

Ireland, Dublin, April 1. *Extract of a letter from* Peake, *in the pariſh of* Aghabulloge, *and barony of* Muſkerry, *in this county, about ten miles from this city, from the Rev.* Marmaduke Cox, *rector of the ſaid Pariſh.*

'Laſt Thurſday, as labourers were making a ditch to incloſe a potatoe garden, one of them dropp'd his ſpade into a deep hole, which obliged him to open the earth to get up his ſpade, where he found a paſſage into fifteen (ſome ſay ſeventeen) very large ſubterraneous rooms or caverns; in one of which, by eſtimation, were about 500 ſkeletons; in another 5 ſkeletons; all intire, and laid at a diſtance of about a foot from each other. I examined one of the ſculls, and found it more perfect and clean, than any boiling or chirurgical art could prepare it; the teeth very regular and diſtinct; but, upon being expoſed a while to the air, it opened and mouldered into pieces. The bones were of a pale reddiſh, or brick colour; ſome others of them appeared as if they were burned. The country people flock'd in ſo faſt, on hearing of this antique piece, that they trod the bones into powder, they being quite deſtitute of oil or ſubſtance, for they were indeed as the ſhadow of bones, *pulvis et umbra ſumus.*

'It is imagined, that there muſt be another paſſage to theſe ſubterraneous chambers from a Daniſh fort about 150 yards from the preſent place of entrance, this being very narrow. The rooms are about five feet high. There are other chambers that are not yet got into, the entrance being defended by large ſtones laid in the doors, which cannot eaſily be removed.

'Whether they were the habitation of the Aborigines Iriſh, or contrived by the Danes about the year 8 or 900, the curious may judge.

'There was a beautiful carved wood comb and comb-caſe found in one of the rooms, but the air mouldered it to duſt.

'P. S. It is ſuppoſed, if an entrance can be made into theſe chambers, defended by the ſtones, that ſome curioſites will be found that will give further light to this affair; for one part of thoſe caverns was their dwellings, and the other part their graves.'

April 15. Laſt Saturday the paving of Eſſex-Bridge was finiſhed, when vaſt numbers of people walk'd over it, and great rejoicings have been made on the occaſion. The paſſage of the old bridge was ſtopt up on the 19th of January, 1753, and the firſt ſtone of the north abutment was laid on the 28th of September following. This is the firſt bridge that has been executed after this manner in any of theſe Kingdoms, and intirely executed by our own countrymen, without ſo much as the loſs of life or limb of any perſon, except one man, who being intoxicated fell in.

LONDON.

Mar. 25. HIS Majeſty having, by a moſt gracious meſſage to the houſe of Lords, ſignified the neceſſity of augmenting our forces by ſea and land, in order to provide for the ſecurity of our colonies in America, as well as for the defence of theſe kingdoms; their Lordſhips addreſſed his Majeſty thereon; to which his Majeſty returned the following moſt gracious anſwer.

"My Lords,

"I thank you for this affectionate addreſs. Nothing ſhall be wanting on my part, that may tend to the effectual ſupport of the juſt rights and poſſeſſions of my crown, and of the true intereſts of my people. The confidence which you repoſe in me, ſhall always be made uſe of with the ſtricteſt regard to thoſe great and important objects."

25. The Trimmer, Bellamy, arrived at Plymouth from Rochelle, who reports, that the French have fifteen men of war, and 20 frigates at Breſt; five at Toulon; four ſeventy-four gun ſhips, and two frigates, lying at anchor near the iſle of Dien; and that they have 20,000 men on the iſland of St. Martins ready to embark.

29. This day the Eaſt India Company ſhipped 2000 ounces of gold coin and 12000 ounces of ſilver coin for their factories.

April 23. About 11 o'clock laſt Sunday night, the poſt-boy was ſtopt, between Market-harborough and Kibworth, by two men, who took from him the Leiceſter, Loughborough, Nottingham, Derby, and Aſhbourn Bags, and then rode off full ſpeed towards Harborough.

A Regiſter *of* THEATRICAL ENTERTAINMENTS.

	Drury-Lane.	Covent-Garden.
Mar. 20.	*Hamlet.*	*Alzira.* —— *Orpheus.*
21.	An *Oratorio.*	An *Oratorio.*
22.	*The mourning Bride.—Engliſhman in Paris.*	*The mourning Bride.—Iriſhman in London.*
31.	*King Henry* VIII.—*Proteus.*	*Coriolanus.* —*Orpheus.*
April 1.	*The Provoked Wiſe.—Duke and no Duke.*	*The Earl of Eſſex,—The Lover his own Rival.*
2.	*The Stratagem,*	*The Stratagem.*
3.	*Every man in his humour.—Engliſh-man in Paris.*	*Romeo and Juliet.*
4.	*The Chances.—Miſs in her Teens.*	*Hamlet.* — *Lying Valet.*
5.	*The Miſtake.—Marplot in Liſbon.*	*Venice preſerv'd.—Orpheus.*
7.	*The Orphan,* — *Engliſhman in Paris.*	*The Provok'd Huſband.—Miſs in her Teens.*
8.	*Zara.* —*The Chaplet.*	*The Spaniſh Friar,* —*The Preſs-Gang.*
9.	*Meaſure for Meaſure.*—*Proteus.*	*Comus.*
10.	*Creuſa.—The Devil to pay.*	*Henry* IV.—*Taſte.*
11.	*The Suſpicious Huſband.*—*Devil to pay.*	*Romeo and Juliet,* —*Preſs-Gang.*
12.	*Much ado about Nothing,—Proteus.*	*Henry* IV, — *Orpheus,*
14.	*Jane Shore.—Lethe.*	*The Rehearſal. Lottery.*
15.	*The Schemers.*	*Jane Shore.—Damon and Phillida.*
16.	*The Diſtreſſed Mother.*—*Lethe.*	*The Miſer.—Miſs in her Teens.*

BIRTHS.

March, 25. The lady of George Low, Eſq; delivered of a daughter.

29. The right hon. the marchioneſs of Granby, of a daughter.

April, 1. The right hon, the lady Romney, of a daughter.

MARRIAGES.

March, 20. The right hon. the earl of Fingale, to miſs Woolaſcott,

22. Mr. Joſhua Ruddock, to miſs Feſtin.

23. The rev. Dr. Abbott, to miſs Farr.

The rev. mr. Powlett, chaplain to his grace the duke of Bolton, to miſs Gunman.

25. Mr, Clovesley, to miſs Lintott, with a fortune of 14,000l.

31. Sir James Cockburn, bart. to miſs Douglas, with a fortune of 10,000l.

April, 1. Mr. Woodgat Hodges, to miſs Atkins.

Mr. W. Hanſon, to miſs Keen,

2. Matt. Howard, Eſq; to miſs Ardeſoif.

The right. hon. George Drummond, Eſq; to mrs. Elizabeth Green, a widow lady of great fortune.

3. Mr. John Wale, to mrs. Croſsfield.

5. Mr. Francis Methold, wine-merchant, to miſs Magdalen Lys.

10. Mr. Richard Matthew, to miſs Felton.

George Barclay, Weſt-India merchant, to Mrs. Mary Richards.

11. Mr. W. Ruſſel, to Mrs, Sanderſon, relict of Edward Sanderſon, Eſq; late high ſheriff of the county of Surry.

13. Mr. Chambers, an eminent painter, to miſs Weſt, with a fortune of 2000l.

15. —— Grimſton, Eſq; to miſs Shaw.

DEATHS.

March 21. The rev. mr. Alex. Young, late rector of Wickham and Eaſt-church in Kent,

22. Mr. Hodges, hoſier, of an apoplectic fit.

The hon. lady Wilmanſon.

23. Mrs. Overall, relict of the late mr. Overall.

24. Mr. John Atkins, coal-merchant.

25. John Edwards, Eſq;

27. The lady Feaſt, relict of the late Sir Felix Feaſt.

28. Mr. Murden, merchant.

April, 2. Iſaac Grantham, merchant.

4. Capt. E. Atkinſon, Weſt-India mer.

5. Mr. Spencer, of London, braſier.

8. Mr. Joſeph Garret, Spaniſh merch.

Mr. Rogers, many years ſexton of St. Michael's Cornhill.

9. Mr. Joſeph Crowdel, merchant.

15. Mr. John Turner, linner-draper.

Mr. Bourn, bookſeller at the Royal Exchange.

Civil and military preferments.

March, 27. The right hon. William, lord Cavendiſh of Hardwycke (commonly called marqueſs of Hartington) was declared by his majeſty lieutenant general, and general governor of his majeſty's kingdom of Ireland.

29. His grace Lionel, duke of Dorſet, made maſter of his majeſty's horſe.

Joſeph York, Eſq; appointed colonel of the regiment of Foot whereof John Waldegrave, Eſq; was late colonel, and likewiſe captain of a company in the ſaid regiment.

April, 3. The right hon. Other Lewis, earl of Plymouth, appointed lord lieutenant of the county of Glamorgan.

ADMIRALTY-OFFICE, *April* 5.

HIS Majeſty has been pleaſed to appoint the following Field-Officers, Captains, and firſt Lieutenants, for the fifty Companies of Marines to be forthwith raiſed, to wit:

Lieutenant-Colonels. James Patterſon. Theodore Drury. Charles Gordon.

Majors. Rd. Bendyſhe. Charlton Leighton. James Burleigh.

Captains.	Firſt Lieutenants.
Hector Boiſrond.	Daniel Campbell.
Gabriel Sediere.	Dudley Crofts.
John M'Kenzie.	George Langley.
Charles Repington	James Hill.
Alexander Cumming.	Alexander Cathcart.
Sir R. Abercrombie.	Francis Hay.
Alexander Douglaſs.	Donald M'Donald.
Edward Rycaut.	John Suttie.
John Wright.	Edward Howarth.
Thomas Dawes.	Robert Douglaſs.
John Tufton Maſon.	John Phillips.
Thomas Sheldon.	John Brown.
Thomas Moore.	Collin Campbell.
John Gordon.	Robert Ewer.
Richard Barker.	Archibald Campbell.
James Dundas.	George Ord.
George Maxwell.	Lancelot Willan.
James Robertſon.	William Frazier.
John Campbell.	James Short.
Claud Hamilton.	George Boſſuque.
John Bell.	James Mercer.
John Dennis.	John Frazer.
Thomas Dalton.	Wm. Aytoun Douglas
Thomas Whitwick.	Denis Bond.
James Hamilton.	Thomas Backhouſe.
Roger Baſket.	Gerrard Dennit.
Henry Greeme.	Thomas Troy.
John Beaghan.	Edward Kyffin.
Samuel Proſſer.	George Gulſton.
Patrick M'Donal.	Richard Denniſon.
Alexander Irons.	William Thompſon.
Charles Webb.	John Elliot.
William Stacey.	John Pitcairn.
Richard Brough.	James Perkins.
Henry Smith.	William Dennis.
John Johnſton.	Ralph Teeſdale.
Leathes Johnſton.	Pierce Dent.
Chriſtopher Gauntlet.	Robert Shirley.
Tooker Collins.	Daniel Campbell.
Walter Caruthers.	John Blinkhorn.
John Vere.	William Lutman.
William Picton.	Thomas Wight.
Richard Shuckburgh.	William Rowley.
Richard Hawkins.	Thomas Stamper.
George Maddiſon.	Thomas Airy.
Charles Grey.	Thomas Smith.
Robert Burdet.	——— Waller.
John Yeo.	Charles Fletcher.
Robert Parkhurſt.	Benjamin Edwards.
Alexander Leſlie.	Enoch Markham.

Whitehall, *April* 12. The king has been pleaſed to conſtitute and appoint the right hon. James lord Tyrawly, lieutenant-general of his majeſty's forces, to be colonel of the Coldſtream regiment of foot-guards, whereof the right hon. William Anne earl of Albemarle, deceaſed, was late colonel; and likewiſe to be captain of a company in the ſaid regiment.

The king has been pleaſed to conſtitute and appoint the right hon. George earl of Albemarle, to be colonel of his majeſty's own regiment of dragoons, whereof the right hon. James lord Tyrawly was colonel; and likewiſe to be captain of a company in the ſaid regiment.

The king has been pleaſed to conſtitute and appoint Philip Honeywood, Eſq; to be colonel of the regiment of foot, whereof the right hon. George earl of Albemarle was colonel; and to be captain of a company in the ſaid regiment.

The king has been pleaſed to conſtitute and appoint Montague Wilmot, Eſq; to be lieutenant-colonel of the regiment of foot, commanded by Hugh Warburton, Eſq; major-general of his majeſty's forces.

The king has been pleaſed to conſtitute and appoint George Lawſon Hall, Eſq; to be major to the queen's regiment of dragoons, commanded by the hon. ſir John Cope, knight of the Bath, lieutenant-general of his majeſty's forces.

The king has been pleaſed to conſtitute and appoint David Bell, Eſq; captain of a troop in the regiment of dragoons commanded by William Kerr, Eſq; commonly called earl of Ancram.

ECCLESIASTICAL PREFERMENTS.

The rev. mr. Dreffield of Featherſtone near Pontefract, made prebend of that collegiate church, vacant by the death of mr. Warwick.

The rev. mr. Thomas Green to the rectory of Coltſworthy, Norfolk.

The rev. mr. William Daddo to the rectory of Off, otherwiſe Offwell, Devonſhire.

The rev. mr. Eraſmus Saunders, D. D. to the vicarage of Wantage, Berkſh.

The reverd. mr. Adams to the rectory of Counde, near Shrewſbury, vacant by the death of the late biſhop of Landaff.

The rev. Dr. Warburton is inſtituted by the Ld biſhop of Durham into the prebend of Durham, late vacant by the death of Dr. Mangey.

The rev. mr. Samuel Welſh to the rectory of Teckenham, Devonſhire, worth upwards of 120l. per annum.

The rev. mr. Parker Rowlands appointed one of the duke of St. Alban's chaplains.

The rev. mr. Chriſtopher Hildyard to the vicarage of North Keſley, London.

The revd. Thomas Bounce, B. A. to the rectory of Ingram in Yorkſhire.

The rev. Sam. Harvey to the rectory of St. Andrew in the Vale, in the county of York.

His grace the Archbp. of Canterbury (on the 3d of *April* laſt) appointed Dr. Hay chancellor of the dioceſe of Worceſter, *&c.* to be vicar-general to his grace, in the room of Dr. Paul lately deceaſed.

His grace the Archbp. of Canterbury (on the 5th of *April* laſt) appointed Dr. Simpſon, chancellor of the dioceſe of London, to be commiſſary of the dioceſe of Canterbury, in the room of Dr. George Paul deceaſed.

His grace the Archbp. of Canterbury has conferred the degree of Doctor of Divinity on the rev. mr. Hildſley, vicar of Hitchin in Hertfordſhire.

The reverd. mr. John Folds is appointed chaplain to the Rt. hon. the marqueſs of Hartington.

The reverd. mr. Thomas Hay is appointed one of the domeſtic chaplains to the Rt. hon. Henry earl of Lincoln.

The rev. Dr. Nicholas Webb is made a prebend of St. Paul's cathedral.

DISPENSATIONS *to hold two livings.*

March 27. The rev. George Secker, A. M. chaplain to the biſhop of Oxford, to the vicarage of Yardley, Hertfordſhire, with the rectory of St. Mildred in Breadſtreet and Margaret Moſes thereto annexed, London, worth upwards of 250l. per ann.

April 4. The rev. William Daddo, A. M. to hold the vicarage of Dunsford in Devonſhire, with the rectory of Offwell in the county aforeſaid, worth upwards of 280l. per annum.

April 12. The Rt. rev. Dr. Richard Newcombe (now biſhop of Landaff) to hold the rectory of Whitchurch, with the chappel of Tilſtock, in Shropſhire; with the rectory of Bedives in Monmouthſhire, with the chappel of Rud Doy in Glamorganſhire.

April 18. The rev. John Eyton, M. A. chaplain to the duke of Roxburgh, to the rectory of Pulverhatch, Shropſhire; with the ſecond portion of the rectory of Westbury in the ſame county.

BILL *of Mortality from* Mar. 18. *to* Apr. 22.

Buried			Chriſtened		
Males	1072	2186	Males	162	915
Females	1114		Females	753	
Under 2 years old	765		Buried,		
Between 2 and 5	165		Within the walls		179
5 and 10 —	66		Without		460
10 and 20 —	62		*Mid.* and *Surry*		1045
20 and 30 —	200		City & Sub. *Weſt.*		502
30 and 40 —	218				
40 and 50 —	211				2186
50 and 60 —	173				
60 and 70 —	160		Weekly *Mar.* 18.		477
70 and 80 —	106		*Apr.* 1.		442
80 and 90 —	50		8.		480
90 and 100 —	10		15.		348
100 and 109 —	0		22.		439
	2186				2186

BT——KR——S.

Mar. 25. Peter Henry Otterſonn, of Hoxton, dyer.

29. Jeremiah Wakefield Hartcup, of Canterbury, inn-holder.

Thomas Hobday, of Bermingham, tallow-chandler.

April 1. Richard Mills, of Old Brentford, diſtiller.

Richard Hawkſworth, of Burſtall, Yorkſhire, woollen-draper.

5. Robert Vicary, of Newton Buſhell, Devon, ſerge-maker.

Thomas Bell, of the Strand, linnen-draper.

8. Tully Lamb, of New-Caſtle upon Tyne, woollen-draper.

15. Tho. Clipperton, of Southgate, carpent.

William Kell, of Weſtminſter, taylor.
John Price, of Hay, Brecon, taylor.
Samuel Oakes, of Scarborough, merchant.
19. Robert Manſer, of Norwich, worſtead-weaver.
John Homan, of London, ſugar-baker.
Julius Homan, of London, alſo ſugar-baker.
Thomas Wickens, of Northampton, carrier.
Henry Cowle, of Berwick upon Tweed, cooper.
22. J. Johnſton of London, wine-merchant.
Edward Baker, of Weſtminſter, victualler.
R. Jennings, of St. Clement danes, victual.
Francis Hammond, jun. of Norfolk, tanner.
Edman Crook, of Briſtol, barber and peruke-maker.

BOOKS, *publiſhed ſince our laſt.* 1755.

ANſwer to *Romaine*'s comment. *Owen*.

Annals of the Empire, 6s. *Millar*.

Authentic Memoirs of the Life of *Richard Mead*, 1s. *Whiſton*.

Addreſs to the Electors of *England*, 6s. *Crowder*.

Bigg's Military Hiſtory of Europe, 6s. *Baldwin*.

Bulkley's notes on the philoſophical writings of lord Bolingbroke, 2s. 6d. *Noon*, &c.

Birth-day of Folly, 1s. *Cooper*.

Commentary on *Boerhaave*, on the venereal diſeaſe, 1s. *Owen*.

Centaur not fabulous, 5s. *Millar*.

——As the title of this work is ſomewhat ludicrous and obſcure, at firſt ſight, and not obvious enough to the underſtanding of common readers; we think it highly requiſite, to introduce here a remarkable paſſage in the dedication to a lady of high taſte, which will fully ſolve the riddle, beyond all diſpute. The words of the author, whoever he may be, are there very clear and expreſſive, and evidently enough ſhew, that his ſole, or principal aim, is to reform an impious, abandoned, and licentious age.—“You will probably aſk (ſays he) why Centaur is prefixed as a title to the following letters. The men of pleaſure, the licentious and profligate, madam, are the ſubject of them: and in ſuch, as in the fabled Centaur, the brute runs away with the man; therefore call them Centaurs. And farther I call them Centaurs, not fabulous, becauſe by their ſcarce half-human conduct and character, that enigmatical, and purely ideal figure of the antients, is not unriddled only, but realized.”

Collection of the Moral Sentiments in Pamela, Clariſſa, and Sir Charles Grandiſon. 3s. 6d. *Hitch*, &c.

Country Gentlemans advice to his neighbours, 3d. *E. Owen*.

—The deſign of this little tract is truly honeſt, and praiſe-worthy, it is intended to reclaim, if poſſible, the preſent profligate age from all the reigning vices now in vogue; and had the author called it a country parſons ſerious exhortation to his too modiſh pariſhoners, we ſhould have contented ourſelves with his title only.

Chit Chat, a novel, 2 vol. 12mo. *Dodſley*.

Dodſley's Collection of Poems, vol. IVth, 3s.

Detraction, an Eſſay, 6d. *Bouquet*.

Duncan's *Cæſar*'s commentaries, 2 vol. in 8vo, *Tonſon*.

Eſſay on Architecture, 3s. *Oſborne*.

Fothergill's Free Thoughts, &c. 4s. *T. Payne*.

Fitz Oſborne's treaty of fruit-trees.

Free (Dr.) his ſeaſonable reflections on the importance of the name of *England*, *Sandby*.

French Scholar's Guide, 2s. 6d. *Keith*.

Hoadley (Biſhop) his 20 ſermons. *Knapton*.

Heathcote's ſketch of lord Bolingbroke's philoſophy, 1s. 6d. *T. Payne*.

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☞ Books ſhut, is ſignified thus, ——

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1	——	——	Do	——	——	Do	Do	——	——	——	——	Do	Do	Do	Do	Do	
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Miſcellaneous Correſpondence,

For *MAY*, 1755.

The ESSAY on the *Uſefulneſs* of MATHEMATICAL LEARNING, *continued from Page* 54 *of our laſt.*

is another much harder piece of *geometry*, which gun-powder has given us occaſion to improve, and that is, the doctrine of projectiles, on which the art of *gunnery* is founded.* Here the geometers have invented a beautiful theory, and rules and inſtruments that have reduced the caſting of bombs to great exactneſs.

Laſtly, navigation, which is made up of aſtronomy and geometry, is ſo noble an art, and to which mankind owe ſo many advantages, that upon this ſingle account thoſe excellent ſciences deſerve moſt of all to be ſtudied, and merit the greateſt encouragement from a nation that owes to it both its riches and ſecurity. And not only does the common art of *navigation* depend on *mathematics*, but whatever improvements are to be made in *naval architecture*, whether the veſſels are deſigned for merchant-men, or ſhips of war; whether for ſwift running, bearing a great ſail, or lying near the wind.

Since then it has been ſhewn, how much *mathematics* improve the mind, how ſubſervient they are to other arts, and how immediately uſeful to the common-wealth, there needs no other arguments to recommend them to the ſtudy of mankind, or any motives to a government to encourage them.

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* There has as yet been no *true theory of the art of gunnery* publiſhed; that on the hypotheſis of the *Parabola* being every way falſe, and quite an *Opprobrium* to mathematical Philoſophy; this great deficiency we ſhall endeavour to ſupply, by a new theory of Projectiles, founded on the moſt certain principles of Philoſophy, and plaineſt demonſtrations of geometry; when we come to treat of this neceſſary art in the courſe of our inſtitutions.

A clear and ſuccinct Account of NORTH AMERICA, Hiſtorical, Geographical, &c. *ſo far as it reſpects the Arguments of the preſent Time, done from authentic Records, and the beſt Relations extant.*

THE beſt writers agree in calling that country *North America* which extends from the *Iſthmus* of *Panama*, in the Latitude of 8° 30' North, and as the ſame is now divided between *Great Britain*, *France* and *Spain*; claiming under their reſpective diſcoveries.

As to what regards *Great Britain*, or more properly *England*, in particular, and upon which our claims are founded, our rights propoſed to be eſtabliſhed, owe their being in the firſt place to the diſcovery of the *Cabots*, in the latter end of the 15th century, about the years 1496 and 1497, and more aſſuredly to the ſeveral grants from the crown, and the reſpective ſettlements in conſequence made therein.

The diſcovery of the *Cabots*, according to the accounts of the generality of our own writers, extends only from the latitude of 38 to 68, including the great iſland of *Newfoundland*, and other leſſer iſlands on the coaſt of the continent within thoſe latitudes, and the *Spaniards* generally pretend that ſuch are the utmoſt bounds of our diſcoveries; but we find that even ſome of their moſt early hiſtorians are leſs partial, in particular *Anthony Galvano*, governor of *Ternata*, one of the *Molucca* iſlands, in a hiſtory which he wrote, of diſcoveries about the year 1550, admits it to be the common opinion, that the *Cabots* diſcovered as far ſouthward as Cape *Florida* in the latitude of 25. And the beſt *French* authors ſeem clearly of the ſame opinion, who, ſpeaking of a previous pretended diſcovery of *John Ponce* of *Leon*, a *Spaniard*, in 1512, *Thuanus* ſays, it is more certain what many affirm, that *Sebaſtian Cabot* had been there 15 years before; and *Richelet*, who publiſhed a tranſlation of the hiſtory of *Florida* from the *Spaniſh* in 1709, in his notes thereon, expreſsly agrees with *Thuanus*; ſo that as to matter of diſcovery, our claim ſeems undoubted from the latitude of 25 to 68, as before mentioned. And *Peter Martyr*, from *Cabot*'s own relation, ſays, that he was in the gulph of *Florida* ſouth of the cape, having the iſland of *Cuba* on his left hand.

The point then of our right by diſcovery being out of the queſtion, it falls next under conſideration what we claim againſt other *Europeans*, by the right of ſettling under ſuch diſcovery, and this will gradually lead us into the hiſtory and geography of this extenſive tract.

The firſt attempt we meet with was by Sir *Humphry Gilbert*, under letters patent from queen *Elizabeth*, dated the 11th of *June* 1578, but which, through various diſappointments were retarded to 1583, when, being joined by ſeveral perſons of diſtinction, he ſailed to St. *John*'s harbour in *Newfoundland*, of which having taken formal poſſeſſion, and made ſeveral grants of the adjacent country, he ſtood away for the more ſouthern parts of *America*; where, after having met with many interruptions and diſappointments, he was, in his return home, by his veſſel foundering, loſt at ſea.

Sir *Humphry* was the half brother of Mr. *Walter Raleigh* by the mother's ſide, who, on Sir *Humphry*'s misfortune, obtained letters patent from the queen, of the like import as his brother's, dated *March* 25, 1584, and under that ſanction, and in concert with Sir *Richard Greenville* and others, his friends and relations, fitted out two ſmall veſſels and ſent them to ſea under the command of captain *Phillip Amidas* and *Arthur Barlow*, the firſt a ſeaman, the other a land-officer. They left *England* in *April* 1584, and taking an unaccountable circuit round by the *Weſt-Indies*, on the 2d of *July*, fell in with the coaſt of *Florida*, from whence coaſting northward about 120 miles, they happened on a convenient harbour, in an iſland of about 15 miles in length and ſix in breadth, ſituate between cape *Hatteras* and cape *Fear*, ſuppoſed to be that now called *Ocacoe*. Here they found Indians and good refreſhment, when after a mutual intercouſe of civilities, and having made ſome ſlight diſcoveries up *Albemarle Sound*, about the middle of *September* they returned ſafe to *England*, bringing with them two of the Natives. This diſcovery, and the fine account they gave of the richneſs, plenty, and beauty of the country gave the queen ſo much ſatisfaction that ſhe named it *Virginia*.

Mr. *Raleigh*, tho' not actually on the voyage himſelf, was on this occaſion, and for other his diſtinguiſhed merits, knighted; and having procured his patent to be confirmed in parliament, with the addition of a proviſo, and the advantageous account of this country having elated the ſpirits of his co-adventurers, induced Sir *Richard Greenville* to make the next voyage in perſon; he ſailed from *Plymouth* the 9th of *April*, and fell in with cape *Fear* the latter end of *May*; when, after many tranſactions and diſcoveries, and leaving behind him 108 perſons, on the iſland *Roanoke*, at the mouth of *Albemarle Sound*, under the government of Mr. *Ralph Lane*, a military man of note, and capt. *Phillip Amides*, returned the ſame year to *England*.

This firſt ſettlement, after various adventures were reduced to very great diſtreſſes, when they were luckily relieved by Sir *Francis Drake*; who, on his return from the taking of *Carthagena*, was eſpecially directed to viſit this colony, and to give them all neceſſary aſſiſtance and encouragement, who propoſed to have left with them ſome ſmall veſſels, 100 men and four months proviſions; but various accidents occurring, and the ſettlers wearied with diſtreſſes, and deſirous to be at home, Sir *Francis* took them aboard; and ſo this attempt towards a ſettlement proved abortive. Sir *Francis*, in his way, touched on the coaſt of *New England*, where he ſtaid a few days, trading with the natives and ſurveying the country, and where one of the *Indian* chiefs made a formal ſubmiſſion to queen *Elizabeth*.

Mr. *Lane* and his company carried home ſome tobacco, the firſt Mr. *Campden* thinks brought into *England*. Sir *Walter Raleigh*, then in high vogue, and much eſteemed by the gay, as well as gallant world, ſoon brought this odoriferous plant into ſuch eſteem, that many great ladies, as well as noblemen, made no ſcruple, ſometimes, to take a pipe; and which the political queen did not fail to encourage, and ſome ſay, uſed it herſelf.

In the interval of Sir *Francis Drake*'s voyage home, with the ſettlers on board him, Sir *Walter* had diſpatched one ſhip, Sir *Richard Greenville* in perſon, with three ſhips, were ſailed to the relief of the colony; but the immature departure of the ſettlers having blaſted their auſpicious views, Sir *Richard*, reſolving not to abandon the country, left, on the iſland *Roanoke*, 50 perſons with two years proviſion, and then returned to *England*.

In 1587 three ſhips were diſpatched under the command of Mr. *John White*, under Sir *Walter*'s patent, and expreſsly directed to ſettle at *Cheſepeake* on the continent. On their arrival they went to *Roanoke*, to look for the 50 men left there; but none were found, and all the information they could obtain on the moſt ſcrupulous enquiry was, that they had been attacked by 300 Indians, in which one *Engliſhman* was ſlain, and the reſt gone they knew not whither.

The ſame year Mr. *White*, at the deſire of the colony, returned to *England* to ſollicit ſupplies, at that unlucky time, when the whole nation was preparing for their defence againſt the intended *Spaniſh* invaſion; however, Mr. *White* obtained two veſſels, but was intercepted by the enemy, and was obliged to return back; and Sir *Walter* being now deeply engaged in the public ſervice, made an aſſignment of his intereſt to Mr. *Thomas Smith*, after Sir *Thomas*, to the ſaid Mr. *White*, and to other merchant-adventurers, and preſented them at the ſame time with 100 *l*.

Theſe new adventurers delayed ſending relief to the colony until *March* 1589-90, when Mr. *White* ſailed with three ſhips from *Plymouth*, and arrived on the coaſt the 3d of *Auguſt*; but not finding any of the people left there, they returned to *England*.

The year following, Sir *Richard Greenville* being ſlain in an engagement with the *Spaniards* at the *Weſtern iſles*, and Sir *Walter Raleigh* in diſgrace with the queen, for cauſes not pertinent here, and his aſſignees proving totally negligent, the ſettlements were entirely abandoned, and the ſettlers left to their fate.

In *March*, 1602, *Bartholomew Goſnold* ſailed from *Dartmouth*, in a bark with 32 men, and, in *May*, fell in with that part of the *American* coaſt now called *New England*; and making ſome ſlight diſcoveries returned home.

In 1603, the mayor, aldermen, and merchants of *Briſtol*, at the requeſt of Mr. *Hackluit*, a prebendary of *Weſtminſter*, fitted out two veſſels, but following *Goſnold*'s courſe, made no ſignificant diſcoveries.

Captain *Gilbert*, the ſame year, made a voyage to *Virginia*: They reached *Cheſepeake* bay, where the captain and four of his men being killed, the ſhip returned.

In 1605. Captain *George Weymouth* was ſent by the Earl of *Southampton*, and Lord *Arundel* of *Wardour*; he intended to the ſouthward of 39, but was, by the North-weſt winds, forced among ſome ſhoals in the latitude of 41; on the 18th of *May*, they made land, being an iſland on the coaſt; after ſome time ſearching, they fell in with the main land, and ſailed ſeveral leagues up a river, ſuppoſed to be *Connecticut*; when after viewing the country, and having ſome intercourſe with the *Indians*, they ſailed for *England*, and arrived at *Dartmouth* the 18th of *July*.

Thus far the reader has been only entertained with attempts and diſappointments, but no other nation, during this courſe, in any ſenſe intervened. Theſe ſlight ſketches have been given to evince our previous claim to this coaſt, which until many years after paſſed entirely by the name of *Virginia*; and as, for the future, theſe adventures wore a more encouraging aſpect, tho' ſubject to various miſhaps and diſcouragements, we ſhall proceed to touch as lightly as poſſible ſuch future attempts as occur until the more firm ſettling of the reſpective colonies, before we can poſſibly give a clear and explicit account of our rights and intereſts in *America* excluſive of all other nations whatſoever, and then ſhall ſtate the geography, topography, and natural hiſtory in the faireſt, and moſt perfect light, that candor, intelligence, and the beſt accounts extant, can make us capable of effecting.

(To be continued.)

Obſervations on the Lunar Eclipſe, March 27, 1755.

Obſerved at London, *by* T. L.

AT 11h 12′ apparent time (by a four foot Refractor and corrected Clock) the Moon was juſt touched by the Shadow; after which, Clouds interpoſed, and no farther obſervations could be made.

The ſame obſerved at Milverton, *in* Devonſhire.

By Mr. Samuel Kingdon.

APparent time, 1755, March 27^d 11^h $4'$ (before which time the Moon was obſcured by Clouds) the Eclipſe had been on ſome minutes, 13^h $20'$ $34''$ the ſea Eatremus (at one end of mount Taurus) emerged; 13^h $33'$ $38''$ the Eclipſe ended; 13^h $35'$ $48''$ the penumbra was quite off the Moon's diſk. The time was obtained by correſpondent altitudes of Arcturus, Capella, and Pollux (in the intervals of flying Clouds) at the time of the Eclipſe,

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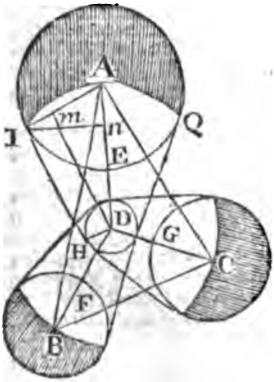
MATHEMATICAL QUESTIONS *Anſwered.*

Queſtion 5, *anſwered by the Propoſer.*

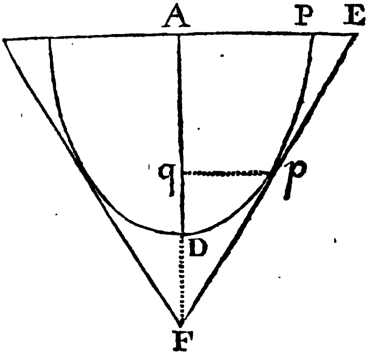


IT is evident that the luminous body muſt be between the other three. Let A, B and C repreſent the three opaque balls, and D the luminous one; for their ſemi-diameters put e, f, i and d; draw D m parallel to H I; let $e - d = q =$ A m, $f - d = r$, and $i - d = s$, and put $x =$ A D, $y =$ BD, $z =$ CD. By ſim. △s, As $x : q :: e : \frac{qe}{x}$ $=$ A n, hence $\frac{ex - eq}{x} =$ E n, and $\frac{ex - eq}{x} \times 2e \times 3.1416 =$ I E Q, the enlightened part of the ball A. In like manner, we get $\frac{fy - fr}{y} \times 2f \times 3.14156$, and $\frac{iz - is}{z} \times 2i \times 3.1416$ for the balls B and C, the ſum of which is a maximum. In Fluxions, $\frac{e^2 q \dot{x}}{x^2} + \frac{f^2 r \dot{y}}{y^2} + \frac{i^2 s \dot{z}}{z^2} = o$, Let $x + y + z = w$, and $\dot{z} = -\dot{x} - \dot{y}$, which put for z in the equation above, reduced, &c. $z^2 = \frac{i^2 s x^2}{e^2 q}$, $y^2 = \frac{f^2 r z^2}{i^2 s}$, and $x^2 = \frac{e^2 q y^2}{f^2 r}$. Or, let $z = nx$, $y = mz$, $x = py$. Now, if A B $= a$, B C $= b$, and A C $= c$, we may have the angle A C D, and the angle B C D (*We ſee no reaſon for this concluſion, as the values of x, y, and z are yet undetermined.**) Hence, if the diameters of the dark balls $= 3{,}5$ and 4, and $4{,}5$, and the diameter of the luminous one $= 1$; alſo A B $= 15$, B C $= 16$, and C A $= 17$, we have A D $= 7.4022$, B D $= 9{,}2678$, and C D $= 11{,}2602$.

W. Bevil.

* T. L. *having given the inveſtigation of this problem from* A B, B C, A C, *and the* four ſemi-diameters *of the balls; we refer, for a determination of this point, to our correſpondents,*

Queſtion 6, *anſwered by Mr.* JOHN ASH.

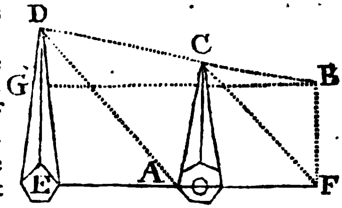


PUT $a =$ tenſion at D, $m =$ A D, $n =$ A P, then by the property of the catenary, $n = a \times$ hyp. log. $\frac{a + m + \overline{2am + m^2}|^{\frac{1}{2}}}{a}$, hence $a =$ 19.027.

Aſſume $x =$ Dq, $y = pq$, and $z =$ Dp, then $\dot{y} = \frac{a\dot{z}}{a+x}$, and $\dot{x} = \frac{z\dot{z}}{a+\dot{x}}$, $\therefore \frac{y\dot{x}}{\dot{y}} = \frac{zy}{a} =$ Fq. Again $\frac{zy}{a} : y :: m - x\,(\text{A}q) + \frac{zy}{a} : \frac{zy + am - ax}{z} =$ A E, $\therefore \frac{\overline{zy + am - ax}|^2}{z}$ will repreſent the minimum reſpecting the triangle, and $\frac{\overline{zy + am - ax}|^3}{z}$ that reſpecting the cone. The firſt of theſe two expreſſions fluxed, made $= o$, and reduced, gives $yz = am - ax$. For x and y ſubſtitute their values $\overline{z^2 + a^2}|^{\frac{1}{2}} - a$, and $a \times$ hyp. log. $\frac{\overline{z^2 + a^2}|^{\frac{1}{2}} + z}{a}$ and it will become $z +$ hyp. log. $\frac{\overline{z^2 + a^2}|^{\frac{1}{2}} + z}{a} + \overline{z^2 + a^2}|^{\frac{1}{2}} = m - a$. From which z comes out $= 32.18$, $x = 18.357$, $y = 24.666$, and the area of the leaſt triangle circumſcribing the whole catenary $= 4116.1154$.

Proceeding after the ſame manner, the dimenſions and ſolidity of the greateſt Cone may be alſo determined.

Queſtion 7, *anſwered by Mr.* JOHN THORPE, *of* Woodborough, *near* Nottingham.



BY the data, and *per* ſpherics, the Sun's altitude was 52° 6′, and the time 10h 35′, at the obſervation, *May* 21, 1754; the altitude 13h 4′, and time 9h 42′, at the obſervation, *Feb.* 3, 1755. By the nature of regular polygons, and *per* queſtion, the radius of the octagonal pyramid is found to be 76,8 Inches, and its perpendicular height 622.97 Inches. Let D A and C B be the directions of the ſhadows at the time of obſervation, and let X be a point where E F and D B meet each other on the horizon. There are given the angle C X O = angle D B G = 13° 4′ and C O = 622.97 Inches, whence X O = 2684.12 Inches, to which if A O be added, we have X A = 2760,92. In the oblique angled triangle X (F) A D, the angle at X, as before, is = 13° 4′, the angle X (F) A D = 127° 54′ and the ſide X A = 2760.92, whence A D = 991.15

991.15 Inches. Laſtly, the angle E A D is given $= 52° 6'$ and A D $= 991.15$, from whence E D $= 782.1$, and A E $= 608,84$.

Hence { The perpendicular height of the octagonal pyramid $= 622.97$ Inches
———————————————— pentagonal pyramid $= 782.10$
Central diſtance — — — — — — $= 685.64$

N. B. The ſlant height of the octagonal pyramid is ſuppoſed to have been taken from the middle of one of the ſides.

Anſwered by Mr. J. Horsfall.

ON *May* 21, 1754, having given the latitude, declination, and azimuth, as in the queſtion, his altitude is found $= 52° 4'$, and the time $10^h 35'$. On *Feb.* 3, 1755, having the ſame data, the altitude is found $= 13° 8'$, and the time $9^h 43'$ *màne.*
Yds. In.
An octagon whoſe ſlant height is 17 15, and periphery at baſe $\frac{3}{4}$ of the
Yds. In.
ſame, will have $=$ 17 9, perephery, height, and the radius of its circumſcri-
Yds. In. *Yds In.*
bing circle $=$ 2 5. By plain Trigonometry, As tangent $13° 8'$: 17 9 ::
Yds. In.
Radius : 73 34 $=$ OX. (Suppoſing X the point where the rays, paſſing by
Yds. In. *Yds. In.* *Ys. In.*
D and C, meet the horizon E F produced) Now, 73 34 + 2 5 $=$ 76 3 $=$ OX, from which and the two angles X(B)DA and D(B)XA, *per* plain Trig.
Yds. In.
E D the height of the pentagonal pyramid is found $=$ 21.5
O E the central diſtance — — — — — $=$ 19.2

This queſtion was alſo methodically and truly anſwered by Mr. Thomas Bowen and *Mr.* Carter *of* Clanfield.

Queſtion 8, *anſwered by* R. E. Henley, Oxon.

LET the given fraction $= \frac{ac}{bc}$; and if the Number required was $= bc$, Then $\frac{abcc}{bc}$ would be a whole N° $= ac$. But $\frac{abc}{bc}$ will be a leſs whole N° $= a$. And ſince $\frac{ac}{bc} = \frac{a}{b}$, and a, and b, are prime quantities, therefore the N° ſought will be always equal to the denominator of the loweſt term of the given fraction.

Anſwered

Anſwered by Mr. Thomas Bowen, *of* Briſtol.

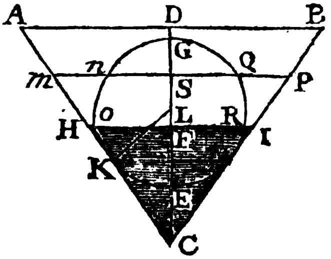
IT being, As the denominator of any fraction : to its numerator : : ſo is the denominator of any other fraction equal in value to the former : to its numerator; the leaſt whole number that will anſwer the condition of the queſtion, is the denominator of the fraction propoſed, reduced to its loweſt terms.

The Propoſer's Anſwer.

LET $\frac{ny}{dy}$ = the given fraction, or any value thereof in lower terms, = $\frac{n}{d}$ in its loweſt terms, and d is the number required. For if n be ſo ſmall as unity, the required number cannot be leſs than d, and if n be greater than unity (putting x = required number) nx cannot exceed d, or dy. Now, when $n = 1$, x is $= d$; and when $\frac{ny}{dy}$ is in its loweſt terms $= \frac{n}{d}$ (putting z for any other number greater than x, and not xy) $z \times \frac{n}{d}$ will leave ſome remainder; wherefore when x or $z = d$, that will be the number required.

This queſtion was anſwered arithmetically by Mr. B. Webb, *and Mr.* David Kennebrook, *without demonſtration. Alſo by* J. W. *of* Baldock.

Queſtion 9, *anſwered by Mr.* Charles Dyer *of* Deptford.



SUppoſe ABC the glaſs, HI the ſurface of the liquor when a quarter full, and GKEG the round ball therein. Now it is plain by the figure, that the liquor will be raiſed above the ſurface HI, as much as the ball is depreſſed in ſolidity below the ſurface HI, which, by the queſtion, muſt be greateſt, or a maximum, but the liquor which is raiſed will be contained all round between the ball and glaſs, ſuppoſing between mnHO, PQIR.

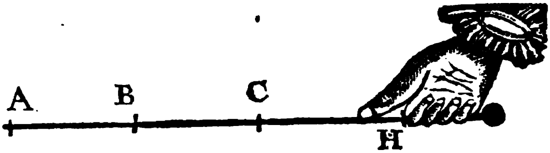
Then let a = CF, the height of the liquor when a quarter full, and $\overline{CD}|^3$: ſolidity ABC, as $\overline{CF}|^3$: ſolidity HIC. That is, as 27 : 12,5664 : : a^3 : 3,1416; whence $a = \sqrt[3]{6,75} = 1,88988$. Again: Let x = KL = GL = EL, and b = AD = 2, c = AC = 3,60555; then $b : c :: x : \frac{cx}{b}$ = CL, and $\frac{cx}{b} - x$ = EC. Let $\frac{c}{b} - 1 = d = ,802775$, then $a - dx$ = EF. But 3 GE × $\overline{\overline{EF}|^2 - 2\,\overline{EF}|^3}$ × ,5236 = ſolidity OER. *Per Ward*'s Theorem. That is, $\overline{ba^2x - 12adx^2 + bd^2x^3 - 2a^3 + ba^2dx - bad^2x^2 + 2d^3x^3}$ × ,5236 = maximum. In Fluxions, and reduced, $d^3x^2 + 3d^2x^2 - 4adx - 2ad^2x = -a^2 - da^2$. Let $\overline{3+d} \times d^2 = b$, and $\overline{2+d} \times ad = k$, and $\overline{1+d}\times a^2=g$, then $x^2-\frac{2kx}{b}+\frac{k^2}{b^2}=\frac{k^2}{b^2}-\frac{g}{b}$ and $x=\frac{k}{b}-\sqrt{\frac{k^2}{b^2}-\frac{g}{b}}=1{,}11604286$, the radius of the ball.

So that the diameter is 2,2320857; but to find how high the liquor will riſe on the ſide of the glaſs, will admit of another queſtion. To proceed: Let $y=\mathrm{ES}$, $a=\mathrm{EC}$, $c={,}7854$, and x as above; then $\overline{\mathrm{CD}}|^3$: ſolidity ABC :: $\overline{\mathrm{CS}}|^3$: ſolidity MPC; but the ſolidity MPC, leſs the ſolidity HIC = ſolidity MPIH = ſolidity NQEN, *per* queſtion; that is, $27 : 125664 :: a^3+3a^2y+3ay^2+y^3 : ba^3+3ba^2y+3aby^2+by^3=$ ſolidity MPC, and $4c=$ ſolidity HIC.

Then $ba^3+3ba^2y+3bay^2+by^3-4c=$ ſolidity MPIH = NQEN; but $\overline{3\mathrm{GE}\times\overline{\mathrm{ES}}|^2-2\overline{\mathrm{ES}}|^3}\times{,}5236=$ ſolidity NQEN $=\overline{bxy^2-2y^3}\times{,}5236$; then $ba^3+3ba^2y+3bay^2+by^3-4c=\overline{bxy^2-2y^3}\times 5236$: This equation reduced is $3{,}25y^3-4{,}8455y^2+2{,}408073y=6{,}030845$; and by ſeries $y=1{,}698104$, then CS $=2{,}594034$, and CM or CP $=3{,}11764$, the height of the liquor on the ſide of the glaſs.

W. W. D.

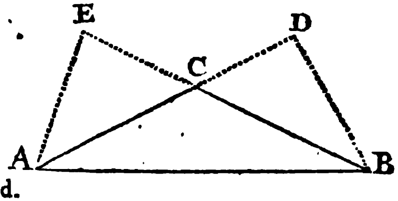
Queſtion 10, *anſwered by Mr.* Bampfield, of Honiton.



BY Fluxions, the center of percuſſion (which is the place where the ſtaff will give the greateſt blow) is $=\frac{2}{3}$ of the its length from the end, ∵ BH = 26.666, and AB = 13.333; and 'tis obvious that BC muſt be = AB, to give an equal blow, becauſe equidiſtant from the center of the greateſt power, ∵ CH = 13.333 = the required diſtance from the hand.

New QUESTIONS *to be anſwered.*

Queſtion 21. *By Mr.* G. Murrant *of* Darlington.



THere is a triangular field ABC, whoſe baſe is 360 yards, and if the ſide BC be continued 'till the ⊥ AE falls thereon, the area will be increaſed 6440 yards; but if AC be continued 'till ⊥ BD falls thereon, the area will be increaſed 6600 yards.

Quere, the ſides and area of the field.

Queſtion 22. *By* T. L.

Given $x^y+y^{\frac{y}{x}}=5000$, and $y^x+x^{\frac{x}{y}}=2000$, Quere x and y?

A Voyage *to the* Planets.

By the Rev. Mr. Fawkes,

SAY, what uncommon cares diſturb my reſt,
And kindle raptures foreign to my breaſt:
From earth's low confines lift my mind on high,
To trace new worlds revolving in the ſky.
Yes — I'm impatient of this orb of clay,
And boldly dare to meditate my way,
Where Fontinelle firſt ſaw the planets roll,
And all the God tumultuous ſhakes my ſoul.
  'Tis he! He comes, and thro' the ſun-bright ſkies
Drives foaming Pegaſus, and thus he cries:
"Ceaſe, ceaſe, dear youth, too ſtudiouſly employ'd,
And wing with me the unreſiſting void;
'Tis thine with me round other worlds to ſoar,
And viſit kingdoms unexplor'd before;
While I ſuccinctly ſhew each various race,
The manners and the genius of the place."
I (tho' my mind, with lively horror fraught,
Thinks on Bellerophon, and dreads the thought)
Mount quick the winged ſteed; he ſprings, he flies
Fleet thro' the liquid azure of the ſkies.
— Firſt, Mercury, ſwift circling round the Sun,
We reach, when thus my friendly guide begun:
"Mark well the genius of this fiery place,
The wild amuſements of the brain-ſick race,
Whoſe minds the beams of *Titan*, too intenſe,
Affect with frenzy, and diſtract the ſenſe.
A monarch here gives ſubject-princes law,
A mighty monarch, with a crown of ſtraw.
Here the lone lover, on the cieling bare,
With charcoal paints his *Chloe* heav'nly fair:
In ſadly-ſoothing ſtrain rude notes he ſings,
Or grates harſh diſcord from the jarring ſtrings.
Lo! an aſtrologer, with filth beſmear'd,
Rough and neglected, with a length of beard,
Pores round his cell for undiſcover'd ſtars,
And decks the wall with triangles and ſquares.
Lo! — But the radiant car of *Phœbus* nigh
Glows with red ardour, and inflames the ſky —
Oh! waft me, hide me in ſome cool retreat;
I droop, I ſicken with the fervent heat."
  Thence to that milder orb we wing our way,
Where *Venus* governs with an eaſy ſway:
Soft breathes the air; fair *Flora* paints the ground,
And fruitful *Ceres* deals her gifts around.
This bliſsful Tempe no rough blaſts moleſt,
Of bluſt'ring *Boreas*, or the baleful eaſt;
But gentle Zephyrs o'er the woodlands ſtray,
Court the tall trees & round the branches play,
Their genial gales diſpenſing as they flow,
To fan thoſe paſſions which they teach to glow.
Here the gay youth in meaſur'd ſteps advance,
While ſprightly muſic animates the dance;
Here the ſoft ſounds of melody inſpire,
Sighs to the ſong, and languors to the lyre:
Fair nymphs and amorous youths, a lovely band,
Blend in the dance, light-bounding, hand in hand.
From ev'ry grove the buxom Zephyrs bring
The rich ambroſia of eternal ſpring.
Care dwells not here their pleaſures to deſtroy,
But laughter, jeſt, and univerſal joy:
All, all is love; for *Venus* reigns confeſt
The ſole Sultana of each captive breaſt:
Cold *Cynthia* here wou'd *Cupid*'s victim prove,
Or the chaſte daughter of imperial *Jove*,
And rigid *Cato* be the ſlave of love.
Now thro' the deſtin'd fields of air we fly,
And leave thoſe happy manſions with a ſigh:
Thence the dire coaſt we reach, the dreary plains,
Where *Mars*, grim god, and bloody diſcord reigns.
The hoſt in arms embattled ſternly ſtands,
The ſword, the dart, the dagger, in their hands.
Here no fair nymphs to ſilver ſounds advance;
But buſkin'd heroes form the Pyrrhic dance;
And brazen trumpets terrible from far,
With martial muſic fire the ſoul to war.
Here mourns the lonely bride, her huſband fled,
The ſterile nuptials, the deſerted bed,
Sighs the long nights, and, frantic with deſpair,
Beats her bare breaſt, and rends her flowing hair:
In vain ſhe ſighs, in vain diſſolves in tears —
In ſleep perhaps the warrior-lord appears,
A fleeting form that glides before her ſight,
A momentary viſion of the night.
Mean while, regardleſs of her tender woe,
The hardy huſband ruſhes on the foe;
Our ears the clang of ringing armour rends,
And the immortal battle never ends.
  Hence thro' the boundleſs void we nimbly move,
And reach the wide extended plains of *Jove*.

Here the ſtern tyrant ſways an iron rod;
A thouſand vaſſals tremble at his nod.
How ſhort the period of a tyrant's date!
The pois'nous phial ſpeeds the work of fate:
Scarce is the proud, imperious tyrant dead,
But, lo! a ſecond lords it in his ſtead.
Here peace, as common merchandize, is ſold,
Heav'n's firſt beſt bleſſing for pernicious gold:
War ſoon ſucceeds, the ſturdy ſquadrons ſtand
Wide o'er the fields, a formidable band;
With num'rous fleets they croud the groaning main,
And triumph for the victories they feign:
Again in ſtrict alliances unite,
'Till diſcord raiſe again the phantom of a fight;
Again they ſail; again the troops prepare
Their falchions for the mockery of war.
The ſon inhuman ſeeks his father's life,
The ſlave his maſter's, and her lord's the wife.
With vengeance thus their kindling boſoms fire,
Since *Jove* uſurp'd the ſceptre of his ſire.
Here frauds, bribes, poiſons, perjuries betray,
And thirſt of gold, and avarice of ſway.
At length we land, vaſt fields of æther croſt,
On *Saturn*'s cold, uncomfortable coaſt;
Here in the gloom the pamper'd ſluggards lull
The lazy hours, lethargically dull.
In caves they live: were ſluggards ever known
To raiſe a citadel, or build a town?
The ſame ſtupidity infects the whole,
Fix'd in the breaſt, and center'd in the ſoul.
Theſe never feel th'ambitious fires of *Jove*,
To induſtry not *Mercury* can move,
Mars cannot ſpur to war, nor *Venus* wooe to love.
Here rove thoſe ſouls, 'tis ſaid, when life departs,
Who left uncultivated uſeful arts;
But ſtupify'd with plenty and repoſe,
Dreamt out long life in one continu'd doze.
No feather'd ſongſters, with ſweet-warbled ſtrains
Attune to melting melody the plains;
No flocks, no herds here feed in paſtures wide;
No fountains muſically murm'ring glide;
Th' ungenial waſte no tender herbage yields;
No harveſts wave luxuriant in the fields.
The woods, if woods there be, lie, leafleſs, low
Beneath bleak mountains of eternal ſnow.
Dull animals inhabit this abode;
The owl, mole, dormouſe, tortoiſe, and the toad.
Dull rivers roll within their channels deep,
And only feed the poppy as they creep;
Whoſe ſtagnant fumes, and dozing draughts invite
Perpetual ſlumbers in perpetual night.
Aghaſt I ſtood, the drowſy vapours lull
My ſoul in gloom, ev'n *Pegaſus* grew dull.
My guide obſerv'd, and thrice he urg'd his ſpeed,
Thrice the loud laſh reſounded from the ſteed;
Fir'd at the ſtrokes, he flies with ſlacken'd rein
Swift o'er the level of the liquid plain,
Glides with the gentle gale, and lights on earth again.

To a young LADY, *attending Mr.* MARTIN's *Lecture on Air, in which a Lark was put into the Receiver, and the Air exhauſted, but was redeemed from death by her Requeſt.*

I.

CL*arinda*, my enchanting fair,
You know that life depends on air;
As without *Sol*'s prolific rays,
No roſe, or flow'r the fields would grace.

II.

You ſaw the lark, poor harmleſs thing,
With blithſome eye, and flutt'ring wing,
Soon change, and on the verge of death,
Panting in vain for ſuccouring breath.

III.

You ſaw, and your requeſt reſtor'd
The needful fluid to the bird:
Then ſhall he ſpend his future days,
To ſing his benefactor's praiſe.

IV.

An emblem here obſervant find,
Of beauty's empire o'er the mind:
As air to birds, to fiſh the ſea,
Supporting are your ſmiles to me.

V.

Are theſe withdrawn, I find with grief
The world can yield me no relief:
Are theſe reſtor'd, no woe I feel;
Suſceptive of no other Ill.

VI.

Then let that paſſion for me plead,
Which roſe to give the ſongſter aid;
So ſhall my lyre unceaſing ſound,
The nymph, as angels fair, is kind as angels found.

To Mr. MARTIN.

SIR,

BY inſerting the under-written Soliloquy in your next Magazine (if you have room) you will oblige

March *Your conſtant reader,*
W. W—TY.

A

Elegy *on a Lady in a Monaſtery.*

Have pity, ye ſhepherds, and hear me complain,
Complaint is my only relief;
O! give me by ſorrow to waſh away pain,
By ſong to anticipate grief.
Ah! wherefore was *Laura* ſo beautiful made?
Yet made like a ſtar in the ſky,
To have her bright luſtre at diſtance ſurvey'd,
Admir'd but never come nigh.
And why was ſhe made like the radiance of light,
To cheriſh all life by her ray?
And yet, by religion eclips'd from the ſight,
Not permitted to out-ſhine the day.
Have pity, ye ſhepherds, and hear my fond tale,
O! hear me and join my complaint;
For why ſhould ſuch virtue be hid by the veil?
Ah why, when already a ſaint?
The dew on the graſs did not ſhine like her eye;
The roſe did not bluſh like her cheek;
The breath of the morn was not ſoft as her ſigh;
As her temper the lamb not ſo meek.
On the high mountain-top ſnow was not ſo white;
The ſwan as her boſom ſo fair;
The jet not ſo black, nor the mirror ſo bright;
As the black and the gloſs of her hair.
Than the coral's bright colour her lips were more red,
More ſoft than the plum or the peach;
Good-nature gave *tongue* to each word that ſhe ſaid,
And *muſic* gave *voice* to her ſpeech.
That ſuch was my *Laura*, ye ſhepherds, confeſs,
And have I not cauſe to complain?
Condemn'd to *deſire*, but never poſſeſs,
To *adore* what I cannot *obtain*.

6th May, 1755.

Epigram *on a proud rich Man.*
By a Lady.

Exult not *ſo*, proud breathing *clay!*
Forgetful that thou *borrow'ſt all:*
Remember, there muſt come a *day*,
When *he*, who *lent thee*, will *recal.*
Then *tremble*, that thy bleſſings paſt,
Have been *unthankfully* enjoy'd:
They were no more deſign'd to *laſt*,
Than to be baſely *miſemploy'd.*

A Soliloquy *on* Death.

To die is to be robb'd of ev'ry ſenſe,
To drop from life into a heap of clay,
To rot and pulverize, and ſhrink to nought.
This much we know——this dying nature teaches.
The lifeleſs trunk, the duſt-corroded urn,
The ſacred grave, and the ſepulchral ſtone,
And hollow vault this doctrine do confirm.
But oh! where flies that being, call'd the ſoul,
Of heavenly formation, that exiſts
To perpetuity, that breath of God,
Which, when enclos'd in man's corrupted fleſh,
Beſtows the pow'r, and faculty of thought?
Oh! thou myſterious death! tremendous name!
And thou her ſiſter, dread eternity!
To you I ſpeak. Oh! ſay, are we to float
On bliſsful oceans in hereafter hours,
Or ſteer our barks acroſs the *Stygian* gulf,
To where grim *Pluto* wrapt in horror ſits,
And knits his brows into a ghaſtly frown?
Ah! why do I invoke theſe ſiſter twins
To name that ſecret, which mortality
Corruptible, and frail, muſt never hear?
As yet no mortal knows, but by conjecture:
The vaſt, th' extenſive philoſophic ſearch
Is fruitleſs all, and puzling to the will.
Reſt here the ſtrict, the great, preſumptive ſearch;
For countleſs, incoherent doubts ariſe;
Thought preſſes thought, in one perplexing round,
And horror ſtupifies inquiring ſenſe.

N. B. *We have omitted* Shakeſpeare'*s Speech to Mr.* H——tt, *as it will undoubtedly give Offence to thoſe Gentlemen now living whoſe Names are mentioned therein.——Some other ingenious Pieces we have alſo omitted for Want of Room, but they will be inſerted according to the Priority of their Dates.*

The Method of taking off Impressions *from* Medals *with Iſinglaſs.*

We ſhall here communicate what we think the beſt method of taking off the *impreſſions of medals*, which is done with Iſinglaſs, or Fiſh-glue, in the following manner. Take an ounce of Iſinglaſs, beat it in a mortar; then pick it into ſmall pieces and put them into a *half pint phial*, and then fill it up with a ſpirituous liquor: *commo brandy*, or *geneva*, is what we generally uſe; put a cork into the phial, with a notch cut in one ſide of it for a paſſage for air, and ſet it by a fire for three or four hours, ſhaking it often in that time; (the heat ſhould be great enough to keep it near boiling all the while.) The Iſinglaſs will then be ſufficiently diſſolved, and the whole muſt be poured into a cloath, and ſtrained off; it is then to be put into a clean phial, well corked, and kept for uſe.

When you propoſe to uſe it, take the glue and ſet it by the fire, and it will ſoon liquify, or become fluid; then, having made the medal clean, and placed it quite level, pour on ſo much of the Glue as will cover it all over, and lie without running off. You then let it ſtand to dry; which, in the ſummer-time, and dry weather, will be in *one day*; at other times it will take near *two:* when it is quite dry, it is ſcarce [illegible]en on the medal; and muſt be taken [illegible]y entering the point of a penknife under one ſide, and it will eaſily riſe off the medal in a clear, tranſparent, and perfect reſemblance of the whole, and every the minuteſt part of it.

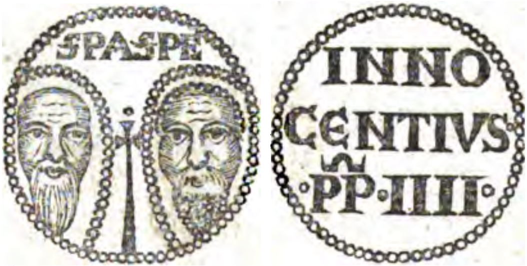
It may be coloured at pleaſure; *yellow,* with *ſaffron*; *green,* with *verdigreaſe*; *crimſon,* with *cochineal, &c.* but we think they look beſt when quite colourleſs.

Alſo, when the Glue is firſt poured on, if you drop over it a piece of *leaf-gold,* or *ſilver,* they will become gilt with thoſe metals in the moſt perfect and beautiful manner.—— This Glue is not only applicable to the purpoſes above-mentioned, but is extremely uſeful in gluing all kinds of *hard wood* (which common glue will not touch); yea, even glaſs and china-ware, when broke, may be joined together again ſo very ſtrong as to ſerve for any common uſe, nor is the joint in china viſible, if dexterouſly put together. And we know, by experience, that a tea-cup, thus put together, will endure the boiling water the uſual time of drinking tea; but as ſoon as it is done with, it muſt be wiped dry.

We ſhall only take notice farther, that this method may be of the greateſt ſervice to the *Antiquarian*; becauſe he can hereby take off the true *antique figure* of his medals, and tranſmit as many of them as he pleaſes to his friends at a diſtance, by letter. Of this we had a curious inſtance of the impreſſions from a *Bulla* of Pope *Innocent* IIII. lately found near *Dover*; this is a kind of ſignet, ſtampt in lead, and appended to thoſe writings, or inſtruments of the Popes, which, from thence, are called *Bulls.* We thought to have gained an *Icon* a little more like the thing, but the workman (who is allowed to be the beſt in his way) has uſed the utmoſt art to repreſent it; and which therefore we hope will be acceptable.

The abbreviation SPASPE, we ſuppoſe, ſtands for *Sanctus Pater, Sanctus Petrus*; *i. e.* Holy Father, and St. *Peter,* the two faces on the medal.

Something farther on this ſubject we may give in a future Number.



N. B. *As perſpicuity in the ſciences is what we principally aim at, and without which no progreſs can be made in the ſtudy of them; we ſhall always think ourſelves greatly obliged to our readers, if they ſhall pleaſe at any time to ſignify to us what they think not ſufficiently explained, amd we will endeavour to make it intelligible.*——— *Therefore, as it is deſired to know, what is meant by* Rev. *in the two laſt Examples of Inſt.* 41. *in page* 11. *of arithmetic, we anſwer; that* Rev. *ſtands for* Revolution; *by which is meant the motion thro' a* compleat Circle, *or the motion of* 360 *Degrees,*
Rev. Sg.
(*ſee Inſt.* 40.) *Hence* 175 10 28° 51′ 42″ *ſignifies, that the Sun or Moon,* &c. *has made* 175 Revolutions *thro' the Ecliptic, and is advanced* 10 *Signs,* 28 *Degrees,* 51′, *and* 42″ *towards another; and ſo of the reſt.*

Mr. T. Rider*'s curious account from* Staffordſhire, *ſhall be inſerted when we come to that county.*

Errata in N°.IV. Natural Hiſtory, *page* 27, *line* 25, *for* tho' 50, *read*, about 12. *P*. 29, *l*. 31, *for* Fig. 11. *read* Fig. 2. *P*. 30, *l*. 34, *for* Circumference, *read* Area. *P*. 31, *l*. 17, *for* are, *read* is. *P*. 31. *l*. 30, *for* fowl, *read* foul.

A Chronological Memoir *of* Occurrences. For *MAY*, 1755.

Spain.

ON the 16th of April laſt, an engagement happened at ſea, a few leagues to the eaſtward of Alicant, between five Spaniſh and three Mooriſh Zebecks, in which the Spaniards ſunk the Mooriſh veſſels, and took 500 priſoners, amongſt whom were the captain and crew of a Dutch ſhip laden with corn, which had been taken by the Moors the day before.

Italy. Two ſhips of war, now at Porto Faraio, are fitting out directly, in order to protect the navigation againſt the Algerines, who already infeſt the coaſt. For ſome time paſt one ſhip of 26 guns, one Zebeck of 16, and one of 10, with Algerine colours, have been cruizing in ſight of Leghorn, where they have already taken three Neapolitan veſſels, one Genoeſe, and one Felucca belonging to Corſica; ſo that neither the Tuſcan nor Dutch ſhips dare put to ſea. Every thing ſeems to be quiet in Corſica. The Barbary cruizers, in ſhort, infeſt the Sicilian coaſt ſo much, that no ſhips dare put to ſea, but thoſe who are in amity with them.—Letters from Algiers of the 4th of April laſt, mention, that the Swediſh and Daniſh conſuls have prevailed on the Dey not to break the peace with their maſters.

Plantation News. At Wilmington iſland, the inhabitants are at open hoſtilities with the French, particularly on the back of Virginia, being about 300 miles from Auguſta, on the river Ohio.

We have advice from Boſton in New-England, that the four provinces have raiſed 7000 men, who are gone on an expedition againſt the French.

Scotland. The ſociety, formed at Edinburgh for the improvement of arts and ſciences, manufactures and agriculture in this country, have agreed to give premiums of different values, for the beſt diſcovery in ſciences; for the beſt printed book of ten ſheets; for the beſt printed cotten or linen cloth; for the beſt imitation of Engliſh blankets; for the beſt ale and porter; for the beſt imitation of Dreſden-work; and for the moſt uſeful invention in arts, &c.

The honourable the barons of the Exchequer have received his majeſties royal warrant in order to paſs the privy-ſeal, granting to the royal infirmary of Edinburgh, the ſum of 8160l. 10s. 6d ½. ſterling. This fund, which commonly went by the name of the invalid fund, was eſtabliſhed before the union of the two kingdoms, by a deduction out of the pay of the forces in Scotland, in order to create a ſum for giving charity to ſuch ſubalterns and ſoldiers, as through age, and being diſabled, were incapable of ſervice; and as through length of time, the invalids eſtabliſhed on the ſaid fund are all dead, the fund became thereby at his majeſty's diſpoſal.

His majeſty has likewiſe been pleaſed to give 2000l. ſterling (500l. to be paid yearly for 4 years) towards carrying on the public buildings in this city.

Ireland. On a rumour that prevailed at Galway in this kingdom, that the French intended to make a deſcent on that coaſt, the principal gentlemen of the Roman catholic religion waited on Stradford Eyre, Eſq; their governor, to aſſure him of their inviolable attachment to his majeſty's ſacred perſon and government, and their utmoſt deteſtation of all his enemies.

On the 23d of April laſt, a ſerjeant's guard was ordered by the general to be poſted at the weſt gate of Galway above mentioned, another at the abby gate; and a third at Dublin-gate; beſides the main-guard being doubled, and a piquet guard, commanded by a captain who mounted every night at the exchange, and patrolled every ſecond hour.

On the 4th of May, his excellency the marquis of Hartington, lord lieutenant of this kingdom, embarked at Holyhead, on board the Wyvill packet-boat, and landed the next morning about 5 o'clock at Skerries. Their excellencies the lords juſtices and ſeveral perſons of diſtinction, ſent their coaches to bring his excellency and retinue to Dublin, where he arrived about two o'clock, accompanied by a great number of the nobility and gentry; and was received on his arrival by the lord mayor, alderman, ſheriffs, &c. with all the demonſtrations of public joy imaginable.

LONDON.

April 25. HIS Majeſty went to the houſe of Peers, with the uſual ſtate, accompanied by his grace the duke of Dorſet, maſter of the horſe, and the Lord of the bedchamber in waiting, and was pleaſed to give the Royal aſſent to divers Acts, and amongſt the reſt to an Act for granting to his Majeſty the ſum of one million to be raiſed by a lottery.

An act for the encouragement of the Britiſh white herring fiſhery.

An act for the encouragement of the whale fiſhery.

An act for encouraging the making of indigo in the Britiſh plantations in America.

An act for the better preventing theft and robberies, and for regulating places of public entertainment.

An Act for Relief of inſolvent debtors, &c. and to 15 private bills. After which his Majeſty made a moſt gracious ſpeech from the throne; in which he acquainted the two Houſes, that the zeal they had ſhewn for ſupporting the honour, rights and poſſeſſions of his crown had afforded him the greateſt ſatisfaction; that his deſire to preſerve the public tranquillity had been ſincere and uniform; that he had thoroughly adhered to the ſtipulations of the treaty of Aix la Chapelle; and made it his care not to injure or offend any Power whatſoever; but never could entertain a thought of purchaſing the *Name* of *Peace*, at the expence of ſuffering encroachments upon, or of yielding up what juſtly belongs to Great Britain, either by ancient poſſeſſions or ſolemn treaties; that the vigour and firmneſs of his Parliament on this important occaſion had enabled him to be prepared for ſuch contingencies as might happen; that if reaſonable and honourable terms of accommodation could be agreed upon, he would be ſatisfied; and in all events relied on the juſtice of his cauſe, the effectual ſupport of his people, and the protection of the divine providence.

After which the Rt. hon. the lord chancellor, by his Majeſty's command, prorogu'd the Parliament to Tueſday the 27th of May next enſuing.

26 There was a great council held at St. James's, at which Time his Majeſty appointed the Regency during his Stay at Hanover; and the next day the Rt. Hon. the counteſs of Yarmouth, the right hon. lord Anſon and the earl of Holderneſs, ſet out for Harwich to embark for Holland, in order to attend his Majeſty to his German dominions; and on the 28th his Majeſty ſet out for the ſame place himſelf.

72. A fire broke out at a workſhop and warehouſe of mr. Smith, a tallow-chandler, &c. at Guilford in Surry, which conſumed the ſame, and did conſiderable miſchief beſides.

29. The Lords of the Admiralty have ordered, that the officers in the fifty new companies of Marines do repair to their ſeveral head-quarters with the utmoſt expedition.

The Bank of England paid into the treaſury upwards of 700,000 l. for contributions to the lottery.

The Peggy ſloop of war, capt. Obrian, ſail'd from Shields this day on a ſecret expedition; as alſo the Maccleſfield Tender, full of volunteers, &c. for the fleet at the Nore.

30. The Committee of the Manſion-houſe had a meeting, and came to a reſolution, that the ſaid houſe ſhould be forthwith finiſhed, and that all proper furniture ſhould be provided for it.

May 1. Arrived an expreſs at St. James's, which brought an account of his Majeſty's ſafe arrival at Helvoetſluys on the 29th of April laſt.

This Day being the anniverſary meeting of the treaſurers and truſtees of the ſeveral charity ſchools within the cities of London and Weſtminſter, &c. the Rt. rev. the lord Biſhop of Norwich preached a ſermon before them on that occaſion, at Chriſt-church in Newgate-ſtreet. About 5000 children went in proceſſion to attend divine ſervice; a very agreeable ſight to abundance of beholders, who rejoiced to ſee ſo many poor deſtitute children ſo decently cloathed, and educated in ſo chriſtian a manner.

5. About ten at night a fire broke out at mr. Walker's a coal-merchant, near lady Parſon's brewhouſe in St. Catherine's, which ſoon communicated itſelf to ſeveral warehouſes, in which were contained hemp, pitch, tar, &c. which were entirely conſumed, and ſeveral houſes were damaged before the flames could be extinguiſhed; the engines for a long time had a great ſcarcity of water; a party of guards from the Tower attended to keep off the populace; and about two in the morning it was got happily under.

8. The lords of the Regency ſat from 5 o' clock in the afternoon 'till two the next morning, on account of the expreſſes from admiral Boſcawen.

9. About 12 o' clook this night a meſſenger was diſpatched from the ſecſetary's office to his Majeſty.

12. This morning commodore Holbourne was appointed an admiral; and the next day ſet out from London for Portſmouth, and ſail'd the day afterwards from Spithead

on a ſecret expedition with eight men of war of the line.

13. The Lords Juſtices, in council this day, ordered that the Parliament which ſtood prorogu'd to Tueſday the 27th of this inſtant May, ſhould be farther prorogued to Tueſday the firſt day of July next.

13 Laſt night a terrible fire broke out at an oil-ſhop, juſt beyond Whitechapel bars, and the flames reaching a barrel of gunpowder, by the exploſion thereof a croſs-beam was thrown over the dwelling-houſe into the ſtreet; and one man was killed, and another died as he was carrying to the Infirmary. The poor man in the ware-houſe was killed in a dreadful manner, and one man more is ſaid to be miſſing.

On the 15th of May 7000 ſtand of arms were ſhipped from the Tower for Ireland.

A Regiſter *of* THEATRICAL ENTERTAINMENTS.

	Drury-Lane.	Covent-Garden.
April 17.	*The City match.*—*Proteus.*	*Richard* III.—*School-boy.*
18.	*The Miſtake.*—*The Devil to pay.*	*The Fatal marriage.*—*School-boy.*
19.	*Henry* VIII.—*Bays in petticoats.*	*The Earl of Eſſex.*—*Orpheus.*
21.	*The conſcious lovers*—*Engliſhman in Paris.*	*The Rehearſal.*—*Virgin unmaſked.*
22.	*Coriolanus.*—*The Devil to pay.*	*The conſcious Lovers.*—*Scapin.*
23.	*The Mourning bride.*—*Marplot in Liſbon.*	*The Diſtreſſed Mother.*—*Harlequin Statue.*
24.	*The Inconſtant.*—*The King and the Millar.*	*Love for Love.*—*Dragon of Wantley.*
25.	*The Man of mode.*—*Tom Thumb.*	*Hamlet.*
26.	*King Richard* III.—*Tom Thumb.*	*The Relapſe.*—*Scapin.*
28.	*The Careleſs Huſband.*—*Miſs in her teens.*	*The Mourning Bride.*—*Sequel to the Dragon of Wantley.*
29.	*The Recruiting officer.*—*Miſs in her teens.*	*Venice preſerved.*—*Lying Valet.*
30.	*Zara.*—*Harlequin in China.*	*The Nonjuror.*—*Miſs in her teens.*
May 1.	*Mackbeth.*—*Proteus.*	*The Way of the World.*—*Virgin unmaſked.*
2.	*The Merry wives of Windſor.*—*Miſs in her teens.*	*The Merchant of Venice.*—*Harlequin Skeleton.*
3.	*The Conſcious Lovers.*—*Miſs in her teens.*	*Henry* IV.—*Virgin unmaſked.*
5.	*Oroonoko.*—*Anatomiſt.*	*Mackbeth.*
6.	*The Provoked Huſband.*—*Miſs in her teens.*	*The Stratagem.*—*Scapin.*
7.	*Every man in his humour.*	*Lady Jane Grey.*
8.	*The Way of the World.*—*Miſs in her teens.*	*Othello.*—*Dragoneſs.*
9.	*Zara.*—*Britannia,* a Maſque.	*The Provoked Huſband.*—*School-boy.*
10.	*The Miſtake.*—*Britannia.*	No Play this Night.
12.	*The Drummer.*—*Miſs in her teens.*	*The Old Bachelor.*—*Scapin.*
13.	*As you like it.*—*Miſs in her teens.*	*The Spaniſh Fryar.*—*Scapin.*
14.	*The Fair penitent.*—*Britannia.*	*Romeo and Juliet.*—*Orpheus.*

BIRTHS.

April 25. Lady Harriot Conyers, delivered of a ſon.

27. The lady of Lewis Monſon Watſon, Eſq; of a ſon.

May 5. The lady of the right hon. the earl of Oſſory, of a ſon.

MARRIAGES.

Apr. 22. W. Salvin, Eſq; to miſs Gaſcoigne.

24. Mr. George Neale, ſurgeon of the London Hoſpital, to miſs Adams, with a fortune of 10,000 l.

Wm Hemming, merchant, to miſs Amey Hamilton, with a fortune of 30,000 l.

25. Sir John Pole, Bart. to miſs Mills.

30. Lewis Way, of Richmond, Eſq; one of the directors of the S. Sea Comp. to miſs Payne, ſiſter to the counteſs of Northampton.

James Evelyn, Eſq; to miſs Medley.

May 1. Sir Bouchier Wrey, Bart. to miſs Threſher, with 20,000 l. fortune.

John Brettle, Eſq; to the hon. miſs Hawley, only daughter of the right hon. lord Hawley.

Tho. Monk, Eſq; to lady Aminta Berresford, daughter of the earl of Tyrone.

DEATHS.

DEATHS.

April 10. Sir Patrick Grant, of Dalvey, Bart. Scotland.

15 The right hon. Ann, countes of Dumfreys, daughter of the late earl of Aberdeen, and ſiſter to the preſent earl.

20. Henry Migget, Eſq; captain in the royal regiment of horſe-guards blue.

Henry Barnard, Eſq;

Mr. Wilkins, clerk in the accountants office, at the general poſt-office.

The rev. mr. Raynes, vicar of Isfield, Suſſex.

23. Samuel Berkley, Eſq;

Capt. William Snell.

Dr. Gideon Harvey, late phyſician to his majeſty's tower, and ſenior fellow of the college of phyſicians.

Richard Hamerſley, Eſq; chief clerk in the land-tax office in his majeſty's exchequer.

Capt. John Field, a commander in the Eaſt-India company's ſervice.

26. Sir John Chardin, Bart.

29. Felix Calvert, Eſq;

The right hon. Philip, lord Aſton, baron of Forfar in Scotland.

Mr. Reynell, one of the common-council of Walbroke Ward.

Thomas Foley, Eſq; (late commander of the Savage ſloop) who went round the world in the Centurion.

William Strode, Eſq; late member of parliament for Reading.

Sir Edmund Bacon, premier baronet of England.

May 6. Sir Charles Loraine, bart.

8. The rev. mr. Martin, of Corſton in Warwickſhire.

10. The rev. mr. Adderley, late rector of Newton St. Loe, near bath.

11. The rev. mr. Carr, late rector of Charing in Kent.

13. Mr. Samuel Rodbard, one of the directors of the million bank.

Mr. Jones, one of the ſealers under the lord high chancellor.

Civil and Military Preferments.

April 23. Dr. Harding, brother to Nicholas Harding, Eſq; member of parliament for Eye in Suffolk, is appointed phyſician of the Tower, in the room of Dr. Gideon Harvey, deceaſed.

25. Dr. Hay, of Doctors Commons, conſtituted his majeſty's advocate general, in the room of Dr. Paul, lately deceaſed.

Major Dalrymple, appointed lieutenant-colonel of gen. Cholmondeley's regiment of dragoons.

Capt. Hepburn, major of the ſaid regiment.

Lieutenant-col. Webb, lieutenant-col. of the earl of Albemarle's regiment of dragoons.

26 His majeſty in council, this day, declaring his intention of going out of the kingdom, for a ſhort time, was pleaſed to nominate the following perſons to be lords juſtices for the adminiſtration of the government during his majeſty's abſence, *viz.*

His royal highneſs William, duke of Cumberland.
Thomas, archbiſhop of Canterbury.
Phillip, earl of Hardwicke, lord chancellor of Great Britain.
John, earl Granville, lord preſident of the council.
Charles, duke of Marlborough, lord privy-ſeal.
John, duke of Rutland, lord ſteward of his majeſty's houſhold.
Archibald, duke of Argyll.
Thomas Holles, duke of Newcaſtle, firſt commiſſioner of the treaſury.
Lionel, duke of Dorſet, maſter of the horſe.
William, lord Cavendiſh, of Hardwycke, commonly called marqueſs of Hartington, lord lieutenant of Ireland.
Robert, earl of Holderneſſe, one of his majeſty's principal ſecretaries of ſtate.
William Henry, earl of Rochford, groom of the ſtole.
George, lord Anſon, firſt commiſſioner of the admiralty.
Sir Thomas Robinſon, another of his majeſty's principal ſecretaries of ſtate. And
Henry Fox, his majeſty's ſecretary at war.

28. John Tracy, of Lincoln's Inn, Eſq; is appointed curſitor-baron, in the room of Edward Barker, Eſq; who reſigned.

May 1. Andrew Coltee Duncarol L.L.D. was by the maſter and chapter of St. Katherine's appointed commiſſary, or official principal of that antient and royal juriſdiction in the room of Dr. George Paul, dec.

2. Mr. John Saville, made vicar choral of Litchfield cathedral.

3. Claudius Amyand and James Rivers, Eſqrs. to be ſecretaries to the lords juſtices.

Henry Cavendiſh, to be a baronet of the kingdom of Great Britain.

6. His majeſty hath been pleaſed to make the following promotions in the army on the Iriſh eſtabliſhment.

Quality.	Officers names.	Whoſe room.	Reg.
Capt.	John Scottow.	Wilſon, dec.	Sack.
Capt. Lt.	Phin. Bowles.	Scottow, pr.	Ditto.
Capt. Lt.	T. Deſbriſay.	Bowles, pre.	Ditto.
Cornet.	R. Bowater.	Deſbriſay, pr.	Ditto.
Enſign.	Trev. Winder.	Bartman, pr.	Richb.
Chapl.	Hen. Bayly.	Coote, reſig.	Black.

12. Commodore Holbourn, created an admiral.

14. W. Bruton, maſter tackle-houſe-por-

ter to the merchant taylors company, was ſworn in a ruler of the ſociety of tackle-houſe and ticket-porters, in the room of Mr. Egleſton, deceaſed.

ECCLESIATICAL PREFERMENTS.

The rev. R. Alleyne to the rectory of Stanford, Nottinghamſhire, worth 180l. per annum.

The rev. W. Davenport, A. M. domeſtic chaplain to his grace the moſt noble duke of Beaufort.

The rev. mr. Dampier one of his majeſty's chaplains.

The rev. Tho. Webb, A. B. to the rectory of Bampton, Wiltſhire.

The rev. Brownl. Toller, domeſtic chaplain to the Rt. hon. Hannah Sophia, counteſs dowager of Exeter.

The rev. Cha. Dodgſon, B. A. to the rectory of Kirkby upon Wiſke, worth upwards of 200l. per annum.

The rev. Tho. Lane, A. B. to the rectory of Saffron Would, Worceſterſhire.

The rev. W. Langhorn, domeſtic chaplain to the Rt. hon. Cha. earl of Peterborough.

The rev. mr. J. Rolle to the living of Berwick St. John, Wiltſhire.

The rev. mr. Dodgſon, domeſtic chaplain to the earl of Northumberland.

The rev. Sayer Rudd, M. D. to the vicarage of Weſtwell, Kent.

The rev. mr. Rd. Berney to the vicarage of Calthorpe in Norfolk.

The rev. mr. Finch elected Tueſday lecturer at St. Bartholomews behind the Exch.

The rev. Herbert Lewis, A. M. made domeſtic chaplain to the Rt. hon. Sackville, earl of Thanet and baron Tufton.

The rev. Tho. Dumford, A. M. to the rectory of Whiteham, Devonſhire.

The rev. mr. Geo. Newton, A. B. to the rectory of Iſcfield, Eſſex.

Whitehall, April 29. Francis Seymour, commonly called lord Fran. Seymour, made prebendary of the collegiate church or free chapel of St. George in the caſtle of Windſor, void by the promotion of dr. Rd. Newcome, to the biſhoprick of Landaff.

J. Davis, A. M. made canon or prebendary of Canterbury, void by the death of dr. Sam. Shuckford, late canon thereof.

Tho. Curtis, A. M. made canon or prebendary of Canterbury, void by the death of dr. Hen. Dawnay, late canon thereof.

J. Oſwald, LL. B. made prebendary of Weſtminſter, void by the death of dr. Rd. Bullock, late prebendary thereof.

DISPENSATIONS *to hold two livings.*

April 19. The rev. Michael Dorret, M.A. chaplain to the right rev. the lord biſhop of Chicheſter, collated to the livings of Walberton; with the the united vicarages of Ruſting cum Yapton.

23. The right rev. Mark Hildeſley, D.D. biſhop elect of the iſles of Sodor and Man, to hold with that biſhoprick the rectory of Holwell, Bedfordſhire; with the prebend of Marſton, otherwiſe Marſton St. Lawrence, founded in the cathedral church of Lincoln.

26. The rev. Sackville Spencer Bale, M. A. to the rectory of Withyham, Suſſex; with the rectory of Chiddington, otherwiſe Chiddingſtone, Kent, worth upwards of 400l. per ann.

Dr. Mark Hildeſley, conſecrated biſhop of Sodor and Man, and on the 27th confirmed.

29. The rev. Richard Wynne, M. A. to the rectory of Ruſhden, Northamptonſhire, with the rectory of Gumley, Leiceſterſhire.

May 3. The rev. Thomas Broughton, M. A. to the rectory of Woſſon, Surry, with the rectory of All-hallows in Lombard-ſtreet, London, worth together upwards of 300l. per annum.

6. The rev. Richard Bullock, M. A. to the conſolidated rectory of Copdock with Waſhbrook, Suffolk; and alſo the rectory of Drayton, otherwiſe Dry-Drayton, worth upwards of 300l. per annum.

B——KR——TS.

April 26. Richard Blackburn, Michael-Cope Hopton, and William Swan, of London, merchants, and partners.
Joſeph Smith, of Enfield, victualler and Butcher.
John Hatchman, of Prittlewell, Eſſex, ſhopkeeper.
John Flint, of London, ſtationer.
29. John Bell, of Sunderland, leather-ſeller.
Alex. Thompſon, of Weſtminſter, embroiderer.
John Robinſon, of Hoxton-ſquare, weaver.
Gilbert Wood, of London, warehouſeman.
May 3. William James, of Ruſſel-ſtreet, Covent-garden, upholſter.
James Pickett, of London, orange-merch.
Henry Wheatley, of Southwark, ſhip chand.
John Bradley, of Covent-garden, diſtiller.
6. John Colliſon, of Chatham, butcher.
Robert Kitchen, of Mancheſter, dyer.
James Farmer, of Alie-ſtreet, Middleſex, merchant.
10. Robert Lower, of London, merchant.
Thomas Woodcock, of Norwich, worſted-weaver.
13. William Gaſkell, of Pall-mall, taylor.
17. Aycliff Buddle, of Fiſh-ſtreet-hill, London, ſtationer.
Robert Croſs, of Norfolk, butcher.
20. Jane Papworth, of Cornhill, London, vintner.
John Hayman, of Weſtminſter, hoſier.
Moſes Moravia, of Duke's Place, London, chapman.

BILL *of Mortality from* Apr. 22. *to* May 20.

Buried			Chriſtened		
Males	704	1484	Males	667	1320
Females	780		Females	653	
Under 2 years old	533		Buried,		
Between 2 and 5	141		Within the walls		105
5 and 10 —	43		Without		358
10 and 20 —	39		*Mid.* and *Surry*		698
20 and 30 —	109		City & Sub. *Weſt.*		323
30 and 40 —	149				—
40 and 50 —	142				1484
50 and 60 —	135				
60 and 70 —	96		Weekly *Apr.*	29.	361
70 and 80 —	62		*May*	6.	350
80 and 90 —	28			13.	440
90 and 100 —	7			20.	333
100 and 109 —	0				—
	—				1484
	1484				

Obſervations on the Weather.

	Mar.	Baro-meter.	Therm.	Pluvia-meter	Hygro-meter.
Apr.	22	29 : 9	31	0 : 0	
	23	29 : 8	28½	5 : 0	
	24	29 : 7	28½	8 : 2	
	25	29 : 6¼	27½	12 : 1	
	26	29 : 5	26	16 : 3	
	27	29 : 4¾	26½	0 : 0	
	28	29 : 3½	25½	20 : 0	
	29	29 : 5¼	23	1 : 0	
	30	29 : 9	22	2 : 3	
May	1	29 : 7	24	0 : 0	
	2	29 : 6	24¾	5 : 5	
	3	29 : 7½	24	5 : 6	
	4	30 : 0	22	0 : 7	
	5	29 : 8	24	0 : 0	
	6	29 : 6	24	0 : 1	
	7	29 : 6	24	18 : 7	
	8	29 : 8	24	4 : 8	
	9	30 : 1	24	0 : 1	
	10	29 : 9½	24	0 : 0	
	11	29 : 7½	25	5 : 1	
	12	29 : 7	25	0 : 1	
	13	29 : 7	25	18 : 0	
	14	29 : 8½	25¾	9 : 5	28 Moiſt.
	15	29 : 8	27	0 : 0	16 Dry.
	16	29 : 9½	27½	3 : 0	20 D.
	17	29 : 9½	25½	0 : 0	20 D.
	18	30 : 2	26	0 : 0	30 D.
	19	30 : 3	24	0 : 0	29 D.
	20	30 : 2	26	0 : 0	20 D.
	21	30 : 1½	29	0 : 0	20 D.
	22	30 : 2	29½	0 : 0	16 D.

BOOKS, *publiſhed ſince our laſt.* 1755.

AN Addreſs to the Clergy for raiſing and eſtabliſhing a Fund, by the Aid of Parliament, to make Proviſion for their Widows and Children. *Owen.* 6d.

Advice to Poſterity. *Freeman.* 6d.— A Pamphlet wrote with Spirit; but no way, it is hop'd, applicable to the preſent Times.

An Apology for the Clergy. *Bladen.* 1s. —wherein the Author undertakes a Vindication of them, from the Abuſes which he thinks are thrown on them by Mr. Romaine, in his Preface to his Commentary on the 109th Pſalm.

Dr. Batt's Oratio Harvæana. *Dodſley.* 1s.

Carte's Hiſtory of England, 4th Vol. *Ruſſel.* 1l. 10s.

Compleat Drawing Book. *Sayer.* 4s.

The Country Gentleman's Advice to his Son, on his coming of Age, in the Year 1755, with regard to his political Conduct, &c. *Owen.* 1s.—The Deſign of this Pamphlet ſeems to be, to lower the violent Spirit of Party in this Kingdom, and conciliate the Affections of all Honeſt Men to one another, which would tend to unite them in every Meaſure for the Good of their Country.

The Free-thinker's Criteria exemplify'd, in a Vindication of M T. Cicero and the late D. of Marlborough, againſt the Cenſure of the late Ld. Bolingbroke. *Owen.* 1s. 6d.

The Natural Hiſtory of Norway. *Linde.* 1l. 5s. in Sheets.—This Book we ſhall ſay ſomething of in our Natural Hiſtory of that Country.

Johnſon's Dictionary of the Engliſh Language, 2 Vol. Fol. *Knapton, Longman, &c.* 4l. 10s. bound.— As the Plan of this Work cannot but be ſufficiently known from the great Numbers of it diſtributed *gratis* for ſeveral Years paſt, we ſhall only ſay, that, in the Opinion of good Judges, the Work has great Merit, perhaps more than any other ſingle Hand could have given it.— The ingenious Author traces our Language from the Days of King Alfred, when he firſt judges it capable of expreſſing all the Sentiments of a civiliz'd People: He gives ſeveral Specimens of the Manner of Writing at that Time, and the many Variations our Language has ſince undergone; illuſtrating his Obſervations by proper Examples in Style and Orthography according to the prevailing Modes at different Periods.— We ſhall give the following Article for a Sample of his Method:

PLEASURE, n.ſ. (*Plaiſer*, French.)

1. DELIGHT; *Gratification of the Mind or Senſes.*

> *Pleaſure, in general, is the conſequent Apprehenſion of a ſuitable Object, ſuitably applied to a rightly diſpoſed Faculty.*
> South's *Sermons.*

A

A Cauſe of Men's taking Pleaſure in the Sins of others, is that Poor-ſpiritedneſs that accompanies Guilt. South's Serm.

In hollow Caves ſweet Echo quiet lies;
Her Name with Pleaſure once ſhe taught the Shore,
Now Daphne's *dead, and Pleaſure is no more.* Pope.

2. LOOSE GRATIFICATION.

Convey your Pleaſures in a ſpacious Plenty,
And yet ſeem cold. Shakeſpear.

Behold yon Dame does ſhake the Head to hear of Pleaſure's Name. Shakeſ. K. Lear.

Not ſunk in carnal Pleaſure. Milton.

3. APPROBATION.

The Lord taketh Pleaſure in them that fear him. Pſalm.

4. WHAT THE WILL DICTATES.

Uſe your Pleaſure, if your Love do not perſuade you to come, let not my Letter. Shakeſp. Merch. of Venice.

He will do his Pleaſure on Babylon. *Iſ.* xlviii.

5. CHOICE; ARBITRARY WILL.

We aſcribe not only Effects depending on the natural Period of Time unto arbitrary Calculations, and ſuch as vary at Pleaſure; but confirm our Tenets by the uncertain Account of others. Brown's *Vulgar Errors*, B. IV.

———*Half their Fleet offends*
His open Side, and high above him ſhews;
Upon the reſt at Pleaſure he deſcends,
And doubly harm'd, he double Harm beſtows. Dryden.

Raiſe Tempeſt at your Pleaſure. Dryden.

We can at Pleaſure move ſeveral Parts of our Bodies. Locke.

All the Land in their Dominions being acquir'd by Conqueſt,
Was diſpoſed by them according to their Pleaſure. Arbuthnot.

To pleaſure, *v. a.* [*from the* Noun.] To pleaſe, to gratify: *This Word, though ſupported by good Authority, is, I think, inelegant.*

———*Things, thus ſet in Order,*
Shall further thy Harveſt, and pleaſure thee beſt. Tuſſer.

I count it one of my greateſt Afflictions, that I cannot pleaſure ſuch an honourable Gentleman. Shakeſpear.

If what pleaſes him, ſhall pleaſure you,
Fight cloſer, or good Faith you'll catch a Blow. Shakeſpear.

When the Way of pleaſuring and diſpleaſuring lieth by the Favourite, it is impoſſible any ſhould be over-great. Bacon.

Nothing is difficult to Love; it will make a Man croſs his own Inclinations, to pleaſure them whom he loves. Tillotſon.

Pleaſureful, Adj. [*Pleaſure and full*] *pleaſant, delightful*, obſolete.

This Country, for the Fruitfulneſs of the Land, and the Conveniency of the Sea, hath been reputed a very commodious and pleaſureful Country. Abbot's Diſ. of the World.

The Chriſtian Philoſoper and Politician; Nº. 1. Vol. 3. *Owen.* Price 4d. — This is a Collection of Eſſays chiefly on religious Subjects; to be continued once a-Fortnight.

Remarks on the ſecond Vol. of the Lord Biſhop of London's excellent Diſcourſes. *Crowder.* 1s. 6d.

Religious Conſcience, or the Morning and Evening Sacrifice; a Poem, in Imitation of Dr. Young's Night Thoughts. *Baker* and *Owen.* Price 1s. — Our Reader may form ſome Judgment of the Work by the following Sentiments:

I tell thee, Philocles, *the poiſon'd Draught,*
The Dagger's Point, the nerve-diſtending Rack,
The boiling Cauldron, and the burning Bull,
Are tender Mercies to the Sting of Guilt.

The Widow of the Wood. *Corbett.* 2s. 6d. — A Story, ſaid to be founded on Fact, which has much the Air of a Romance.

The Will of Dr. Richard Rawlinſon. *Fletcher* and *Rivington*, 1s, — particularly remarkable for his Endowment of an Anglo-Saxon Lecture in St. John Baptiſt's College Oxon. — As we are a Trading Nation, it would be a glorious Deſign and well worthy of Perſons truly publick-ſpirited, to found a Lecture for Trade and Commerce in each of our Univerſities; which would render our young Nobility and Gentry, who are likely to have a Share in the Legiſlation of their Country, proper Judges of its true Intereſts.

Foreign Books, publiſhed in the Months of *January, February, March*, 1755.

ORdres *Monaſtiques: Hiſtoire, extraite de tous les Auteurs qui ont conſervé à la Poſterité ce qu'il y a de plus curieux dans chaque Ordre.* Tom. III. Part I.

Lettre ſur la Guériſon radicale d'un Cancer, au moyen d'une Infuſion de Bella-donna.

Inſtruction Chrêtiénne, en cinque Tomes, 8vo, publiées par les Soins d'une Societé de Gens de Lettres à la Neuveville *en* Suiſſe. 1754.

Hiſtoire de l'Académie Royale des Sciences; Année 1749. Paris. *Quarto.*

*Relation de Miſſions du Paraguai, traduite de l'*Italien *de Mſr. Muratori.* Paris. 8*vo.* 1754.

Hiſtoire, et Memoires de l'Academie des Sciences et Belles Lettres de Berlin, *pour l'Année* 1752. *Tom.* VIII*me*, *Quarto.* Berlin.

Cinq Eſſais ſur autant d'Endroits remarquables dans l'Hiſtoire Sainte. A Londres, *chez* Millar, 1753. *Octavo.*

Memoires ſur l'Inoculation de la Petite-Verole, &c. *par Mſr. de la* Condammé, *&c.* — *Eſſai apologétique ſur la Methode de communiquer la Petite-Verole,* &c. *par Mſr.* Chais, *&c.*

[To be continued.]

EACH DAY's *Price of* STOCKS, *in* MAY 1755.

☞ Books ſhut, is ſignified thus, ———

Days	BANK Stock.	E.-India	South Sea	S. Sea old An. 1ſt Su	S. Sea old A. 2d Sub.	S. Sea Ap. new 1ſt S.	S. Sea An 2d Subſc.	3½ Ba. An 1ſt Subſc.	3½ Ba. An 2d Subſc.	3½ *per* C. India An.	3 *per* Cent India An.	Ba. 3 *per* Cents.	3 *per* Cent An. 1751.	India Bon præm.	B. Cir. *per* *l. s. d.*	Wind at *Deal.*
24	125¼	No Price.	No Price.	———	———	97¼a⅜	No Price.	99a⅛	———	94	93¾	96⅝a¾	96	25s a 26	1 5 0	S W b W
25	126	172½	109¼	———	———	No Price.	97	———	———	94¼a⅜	94⅜	96⅞	96¼	27s	No Price.	S W
26	No Price.	No Price.	No Price.	———	———	98¼	Do	———	———	94¼	94	97	Do	25s a 26	1 5 0	E
27	Sunday															S W
28	No Price.	172	109¾a110	———	———	98⅜a½	No Price.	97⅛a¼	96¼	94⅝	94¾	97¼a⅜	96¾a⅞	26s a 27	1 5 0	Do
29	126¾	No Price.	No Price.	93¾	———	99⅛	Do	97⅜a½	96⅓a⅜	No Price.	94½	Do	No Price.	29s a 32	1 7 6	N N W
30	No Price.	172¾	Do	No Price.	96½a¾	90a¼	97⅞a98	97½	No Price.	95½a⅝	No Price.	97¾a⅝	Do	32s a 34	Do	N W
1	Do	No Price.	Do	98¼	97¼	98⅞a99	97⅞a¼	97⅜a½	96¼	95⅜a½	95⅓	97½	97⅛	33s a 34	Do	S W
2	126⅜	Do	Do	98⅜	No Price.	99⅜	98	97½a⅝	No Price.	95½a⅝	Do	97¾a98	97½	32s a 33	Do	Do
3	No Price.	Do	Do	Do	96⅝a¾	99	97⅞	97⅝	96½	Do	Do	98	No Price.	33s a 32	1 12 6	S b E
4	Sunday															S E b E
5	126½	173	110	98¼	No Price.	99¼	No Price.	98⅛	No Price.	96⅛	95⅞	98	98¼a⅜	38s	1 12 6	S W
6	127¼	127¼a½	No Price.	100a¼	Do	100a⅛	Do	98⅜	98⅛	96⅞	96⅜	99⅛a¼	No Price.	39s	1 17 6	W S W
7	126¾	173	110¾	99½	Do	No Price.	98¾	98¾	No Price.	Do	96¼	99	98¼	39s	No Price.	S W
8	126¼	172½	110¼	99⅛a½	Do	99¼	No Price.	97¾	Do	No Price.	No Price.	98¼	No Price.	37s a 32	1 12 6	S W b W
9	Do	172¾	110	99⅛a¼	97¼a⅜	Do	Do	98a97¾	Do	96¼	96	98½a⅜	97¾	32s a 33	Do	E N E
10	No Price.	Do	No Price.	99¼	Do	99½	98¼a⅜	98a⅛	97a⅛	96⅛a¼	95⅞a96	98¼	Do	36s a 37	Do	S W
11	Sunday															E N E
12	126½	173	110⅞	No Price.	No Price.	No Price.	No Price.	98¼	97	96⅜a½	96	97¼a½	98⅓a½	38s a 37	No Price.	Do
13	Do	173¾	111	100	Do	100	Do	98½	97⅛a½	96½	96¼	98⅛	98¾	39s	1 17 6	N
14	127	Do	Do	Do	97⅞	Do	98⅞	98¾	Do	97¼	96¼	99¼	Do	40s	2 0 0	N E
15	128	175	111¾	100⅛a⅜	No Price.	100½	No Price.	99¼	98¼	97½	97⅛a¼	99⅞	99⅛a½	44s a 45	2 5 0	W S W
16	127¾a⅞	174	111⅜	100⅛	Do	100	Do	98¼	97¼	97⅛a⅜	97a96¾	99⅜a⅜	No Price.	43s a 44	Do	N E
17	Do	No Price	No Price.	100	97¼a⅞	Do	98⅞	98½a⅝	97½a⅝	97⅛	96⅞	99	Do	46s	Do	W
18	Sunday															N W b N
19	127¼a⅜	173⅜	110½a⅜	100	97¾a⅞	100	98⅞	98½a⅝	97¾a⅝	97⅛	96⅞	99	98½a¾	46s	2 5 0	N E
20	127	Do	110⅝a¾	Do	97⅞	Do	Do	98⅜	97⅓a¾	97	96¾	Do	98½a⅝	44s a 45	Do	Do
21	126⅝	Do	110½	99¾	97⅝	99¾	98⅝	98⅜	97	96⅞	Do	No Price.	No Price.	45s	Do	N E b N
22	126¾	173¾	110¾	100	98	98⅞	98¾	98½	97½	97⅛	97	99½a⅝	99a⅛	44s	Do	N N E
23	Do	174	111	99¾a100	97½	99⅞a100	Do	98⅜a½	97¼a½	97	96¾a⅞	99⅝a⅞	Do	44s	No Price.	N b E

Mark-Lane.	Baſingſtoke.	Reading.	Farnham.	Henley.	Guildford.	Warminſter.	Devizes.	Glouceſter.	London.
[illegible]	[illegible]	6l to 7l 7s lo.	to 14ol load	6l 17 to 7l 15 lo.	07l 7s 6d load	24s to 30s qr	[illegible]		

Miſcellaneous Correſpondence,

For *JUNE*, 1755.

A clear and ſuccinct Account of NORTH AMERICA, Hiſtorical, Geographical, &c. *continued from Page* 71.

It is ſaid before, and I think generally agreed, that *John Ponce de Leon* was 15 years later in his diſcovery of *Florida* than the *Cabots*, and the earlieſt diſcovery, we any where find, made by the *French* is ſtill 12 Years later, even to *Canada*, which nothing but poſſeſſion and capacity to hold gives them any title to, in the *European* notion of ſuch kind of claim; for in reſpect to the natives, the claim is by purchaſe or conqueſt, and the former of theſe the moſt rational and juſt, and indeed, the moſt ſecure too, as the proprietors of *Penſylvania* have both to their honour and intereſt proved it. Therefore, as to the argument in view, and for which our title is now regularly deducing down, it ſuffices, that we were the firſt diſcoverers; but it materially ſtrengthens our claim, that we were the firſt ſetlers likewiſe; that upon *Canada* and *Louiſiana* we have a fair claim; but no *European* nation whatſoever the leaſt pretence of claim on any part of *America*, whereof the ſubjects of *England* are poſſeſt; and this is what we propoſe to ſhew in the courſe of our relation.

As we are now on the verge of a firſt and permanent eſtabliſhment in *America*, it is neceſſary to obſerve, in as conciſe a manner as poſſible, by what methods, and by whoſe means, after ſo many diſcouragements, negligences, and diſappointments, the ſame was effected.——The ſame *Bartholomew Goſnold*, mentioned before to have ſlightly viewed ſome part of the coaſt, was ſo much delighted with the country, as to ſet his whole heart on the peopling it; but as on his own bottom, he conceived, from his obſervations and experience of others, it would be impracticable, he therefore turned his thoughts to the engaging of ſuch perſons of power, intereſt, and wealth, as might eſſentially conduce to the end at which he aimed. He was near four years, that is to ſay, from the year 1602 to 1606, applying to various perſons in vain; when at length he very luckily became acquainted with Capt *John Smith*, a man, who will make a figure in the courſe of this work, and whoſe hiſtory, previous to this engagement, is of ſo extraordinary and romantic a nature, that, had I room for biography here, would ſingularly amuſe the reader. This Capt. *Smith*, Mr. *Edward Maria Wingfield*, and the Rev. Mr. *Hunt*, undertook with Captain *Goſnold* the conduct of this affair; but ſtill not being ſtrong enough on their own bottoms, they ſometimes ſeparately and ſometimes jointly, made their application to various perſons of diſtinction, nobility, gentry and merchants, and having engaged a ſufficient number, they next applied for, and obtained from King *James* a patent, which divided the coaſt of *America* into two colonies, the ſouthern and the northern: this patent bears date the 10th of *April* 1606, and appoints Sir *Thomas Gates* and others for the ſouthern, and *Thomas Hanham* and others for the northern; the ſouthern was appropriated to the city of *London*, and extended from the latitude of 34 to 38 on the coaſt, and inwards to the Latitude of 41; the northern was appropriated to *Briſtol*, *Exeter*, *Plymouth*, and the weſtern parts of *England*, and was to extend from the latitude of 38 to 45.—Beſides this charter, the king, under his ſign manual and privy-ſeal, ordained a council, under the name of the King's Council of *Virginia*, conſiſting of 40 perſons of high character and diſtinction; amongſt whom thoſe who make any figure in the following hiſtory, were Sir *Thomas Smith*, Sir *Thomas Chaloner*, Sir *Edwin Sandys*, and Sir *Thomas Roe*. Under which powers the firſt, or ſouthern colony, ſtill called *Virginia*, was undertaken, and of this conſtitution Sir *Thomas Smith* was appointed treaſurer; and the care of the expedition committed to Capt. *Chriſtopher Newport*, a mariner of great abilities, with two ſhips and a bark properly provided, and commanded under him by Capt. *Goſnold* and Capt. *Ratcliff*, with ſuitable orders and inſtructions how to proceed, with particular directions, if poſſible, to find a paſſage through to the *South Seas*, which ſeems to have been the main view of this enterprize.

The 26th of *April* 1607, they arrived on the coaſt of *Virginia* near *Cape Henry*, by them ſo named in honour of the prince of *Wales*; and being extremely pleaſed with the Country, they ranged about 'till the 13th of *May*, when they agreed to ſettle on a peninſula on the north ſide of the river *Powhatan*; this place, in honour of his majeſty, they named *James Town*, and having opened their inſtructions, they found Mr. *Wingfield*, *Goſnold*, *Smith*, *Newport*, *Ratcliff*, *Martin*, and *Kendal*, appointed for the council; and Mr. *Thomas Hudley* was by them elected treaſurer. By the 15th of *June* their affairs were pretty well adjuſted, and having a fair intercourſe, and fixing terms of peace with the natives, Capt. *Newport* ſailed for *England*, leaving behind him 100 perſons: but thro' the neglect of the council in *England*, or their treaſurer being extremely ill provided, they were ſubjected to various diſtreſſes, too prolix in the relation for the compaſs here aſſigned, and were ſingly ſupported and encouraged by the diſtinguiſhed courage and diſcreet management of Capt. *Smith*, who was at length, fighting alone againſt a number of the natives, by a meer accident taken priſoner, and in the event preſerved by the affection of a young *Indian* damſel, daughter of the emperor of *Powhatan*, and by her conducted back to the colony. This, though not immediately to our purpoſe, is mentioned here, becauſe the lady hence makes ſome figure in this account, and will be found married to an *Engliſh* gentleman, and died in *England*: her name was *Pocahontas*; and ſhe is ſaid to have been a very amiable perſon.

In the latter end of this year, Capt. *Newport* arrived with ſupplies in two ſhips, in one of which he ſoon after returned; and the other in the opening of the ſpring 1608, laden with Cedar, likewiſe ſailed for *England*.

As the ſummer approached, Capt. *Smith* employed himſelf in making various diſcoveries; on the 16th of *June*, they fell in with the mouth of *Patwomac* river, and having ſearched it thoroughly, they ſet ſail for *Rappahanoc*; and having made proper obſervations, returned the 17th of *July* to *James Town*, where the people made him preſident inſtead of Capt. *Ratcliff*, who had abuſed them, and riotouſly waſted their ſtores.

24 *July*, Capt. *Smith* ſet out again in a ſmall veſſel with twelve men on further diſcoveries; he met in his courſe ſeveral canoes of warlike *Indians*, at preſent known by the name of the *Senecas*, or ſix nations, with whom, after ſome conteſt and Bravadoes on both ſides, he engaged in friendſhip.

The next day they fell in with a fleet of armed canoes of the nation of the *Tockwayhs*, and having made peace with them, was viſited by the *Suſquehannas*, a numerous and gigantic people, living in paliſadoed towns; and by theſe people Capt. *Smith* was firſt informed of the *French* having ſetled in *Canada*, with whom they traded for hatchets, by the way of the lakes.

While Capt. *Smith* was purſuing his diſcoveries here, and making good his ſettlement, the intereſt of the northern colony was embraced in *England*, and undertaken by ſeveral perſons of diſtinction. They ſet out a veſſel, well provided in *May* 1607, and fell in ſomewhere to the northward of *New England*, from whence after various diſtreſſes, they returned to *England* in 1608.

About this time alſo Capt. *Henry Hudſon* diſcovered *Long Iſland*, *New York*, *Hudſon's River*, and the parts adjacent, and meeting with no encouragement at home, ſold them to the *Dutch*. This ſale was excepted againſt as the diſcovery was made under the king's commiſſion; however, the *Dutch* crept in by degrees, conſtructed *New Amſterdam* and ſeveral other towns, fortified them, and (by their accuſtomed induſtry) made it a flouriſhing colony.

In the latter end of this year, 1608, *Newport* arrived in *Virginia* with a freſh ſupply of people and proviſions, amongſt the reſt Mr. *Weſt*, brother to lord *Delaware*, ſixteen other Gentlemen, and two women, the firſt in the ſettlement, and was returned home with ſome trials of pitch, tar, glaſs, frankincenſe, and ſoap-aſhes.

In the ſucceeding year 1609, the colony attained to ſome degree of perfection and plenty; they made a conſiderable quantity of tar and pot-aſhes, planted 40 acres of ground, and were well ſtored with hogs, poultry, and other cattle.

The ſame year, the council in *England* applied for a new charter, and obtained it; by this, the council in *Virginia* were abrogated, and lord *Delaware* was appointed captain-general, Sir *Thomas Gates* his lieutenant, Sir *George Sommers* admiral, *Newport* vice-admiral, Sir *Thomas Dale* high marſhal, and various other officers for life. And as the earls of *Saliſbury*, *Suffolk*, *Southampton*, *Pembroke*, and various other perſons of diſtinction were included in this charter, as well as ſeveral public companies, a large ſum of money was raiſed, and nine ſhips, with 500 men, diſpatched to recruit and enlarge the colony, under the direction of *Gates*, *Sommers*, and *Newport*, who, not agreeing about the command, went all aboard of one ſhip, and were with 150 men wrecked in a hurricane on *Bermudas*, a ſmall ketch foundered in the ſame ſtorm, the other ſeven arrived ſafe, bringing with them a parcel of the moſt debauched, idle people, that were perhaps ever ſince ſent to that country; but *Smith*'s ſuperior courage and induſtry conquered all obſtacles; he ordered Mr. *Weſt*, with 120 of the beſt men, to make a ſettlement at the *Falls*, and Mr. *Martin*, with near the ſame number, to *Nanſamond*, where behaving meanly, he was treated with great contempt by the natives, and Mr. *Weſt* returning immaturely, capt. *Smith* entered into a treaty with *Powhatan* for a more convenient ſettlement, and ſeated mr. *Weſt*'s people there, which they ſoon after abandoned, and returned to the *Falls*.

Capt. *Smith*, who had been hitherto the ſoul of the colony, was now, by the accidental fire of ſome powder that lay in the boat between his legs, ſo diſabled, as to be utterly incapable of performing any further ſervice to the colony, and therefore obliged to return to *England*.

To his vigour, induſtry, and undaunted ſpirit, the eſtabliſhment and firm ſetling of the colony was certainly owing, and this unhappy accident the appropriated cauſe why this colony, for a long time after, remained in a tottering, or rather declining ſtate, as will but too well appear in the courſe of the various events hereafter related.

It has been ſaid before, that the admiral ſhip, with Sir *Thomas Gates*, Sir *George Sommers*, and Capt. *Newport*, were wrecked on *Bermudas*, the ſhip, after various endeavours to clear the coaſt, ſtruck upon a rock, but the high ſurges forced her off again, and violently carrying her in amongſt a great cluſter of other rocks, at length providentially ſo ſeated her between two, that ſhe was jammed in firm and immoveable, to the great joy and ſurprize of them all, but ſtill more heightened by a ſudden change of wind, or rather of weather and ſoon after it became quite calm. This gave them full leiſure, with all requiſite convenience, to unlade the ſhip, and land all their ſtores, proviſions, &c. quite out of any future danger.

Here, inſtead of a complicate ſcene of barren rocks, wild waſtes, and dreary deſarts, they found, to their unſpeakable ſatisfaction, one of the fineſt countries in the world, and ſo afterwards celebrated by that diſtinguiſhed poet Mr. *Waller*. They found all the fruits of the climate in great plenty and perfection, the inter-jacent currents amongſt the rocks ſtored with excellent fiſh, a great number of wild hogs, in the woods birds of various kinds, and in the plains a vaſt ſuperfluity of ſalubrious herbage. The hogs may be ſuppoſed to have bred here from ſome left by *John Bermudas*, the diſcoverer in 1522; and it was equally ſatisfactory, that they found here cedar in great abundance, with which they built two ſmall ſhips, that particularly of Sir *George Sommers*, in which he embarked, had not any iron in her, except one bolt in the keel; theſe they rigged, with what they ſaved from the wreck, and all things being now in readineſs, after nine months abode, they, on the 10th of *May* 1710, ſet ſail for *Virginia*, where they arrived the 24th.

They found on their arrival the colony reduced to great miſery and diſtreſs, owing, as before, to their indolence, inactivity, and ſome particular maxims of the eſtabliſhment materially contributing thereto. As in the firſt place, the want of judging rightly what kind of people were proper to begin a new ſettlement; what kind of laws juſt and equal; what kind of immediate directors; and that they were appointed to work and trade on the common ſtock of the proprietors for their intereſt only; without any proſpect of perſonal property or advantage to themſelves, and this, rather under martial, than the municipal laws of their own country, as ſoldiers, rather than as labourers, and as ſlaves, rather than as freemen. Theſe were diſcouragements, the beſt would not have ſucceeded under, and made the worſt totally deſpair of mending their fortunes in a country, where their bread was to be laboured hardly for, and their lives at the ſame time to be defended at daily imminent hazard, ſo that they became rather plunderers than improvers, and ſeeking the corn of the natives, rather than planting themſelves; the natives, on their parts, removed it early out of their reach, and occaſionally lying in ambuſh frequently cut them off, when meer deſpair and neceſſity obliged the coloniſts to ſeek abroad for ſuſtenance. This, with a climate unaccuſtomed to, and the evils of hunger and ſickneſs preying at the ſame time on their vital ſtrength and ſpirits, their former, as well as preſent ſituation ſeems not difficult to account for; nor conſequently, the long time it required to fix a firm and permanent eſtabliſhment.

The two colonies of *Narſamond* and the *Falls* Sir *George* found, at *James Town*, complaining they had loſt their boats, and nearly half of their men. Their principals *Weſt* and *Ratcliff* were diſpatched in ſearch of proviſions; *Ratcliff* to *Powhatan*, where he was cut off with 30 of his men, only one of the company, a boy named *Henry Spilman*, a gentleman's ſon, eſcaping by means of *Pocahontas*, and Capt. *Weſt* went off for

England; and the whole colony being reduced to extreme miſery, Sir *Thomas Gates* and Sir *George Sommers* agreed to embark them, and follow Capt. *Weſt*; but as they were falling down the river, they perceived, at a place now called *Mulberry Point*, a ſhip's long-boat, and ſoon after the fleet under Lord *Delaware*, appointed captain general of *Virginia*, and returned back to *James Town*; and his lordſhip's arrival giving quite a new turn to their affairs, they, by his advice and example, applied themſelves to a more induſtrious and effectual conduct.

Sir *George Sommers* undertook to increaſe their preſent ſtock of proviſions from *Bermudas*, but unhappily died in the expedition at the iſland, and his nephew, expreſly againſt his dying commands to return to *Virginia* laden, ſet ſail for *England*.

Capt. *Angel* was ſent to *Patowmac* river to trade for corn, where he found *Henry Spilman*, and returned laden to *James Town*.

On the firſt wreck at *Bermudas*, two of the men were left behind, named *Carter* and *Waters*, who lived there very ſociably. On this laſt expedition, Mr. *Sommers* left another man behind him, named *Edward Chard*, and now the colony being encreaſed to three people, they found it neceſſary to have a king to govern them, as their wealth had encreaſed by the diſcovery of a large quantity of ambergreaſe, of the eſteemed value then of near 10,000 *l.* the main conteſt for power lay between *Waters* and *Chard*, and they agreed to fight it out, in order to determine which of them ſhould have *Carter* for their ſubject, but *Carter* having very wiſely hid their arms, ſoon after reconciled them to himſelf and to one another; and for the future, they continued on the footing of equal government a friendly *democracy*.

Lord *Delaware* in his government conſtructed two Forts at *Kicquetan*; the one he named *Fort Henry*, and the other *Fort Charles*, on the points of a ſmall ſtream, which they called *Southampton* river, and in a very healthy ſituation, calculated to receive new comers on their firſt arrival from their native country to ſeaſon them to this.

Sir *Thomas Gates* was diſpatched by his lordſhip for *England*; and his lordſhip ſoon after, finding himſelf attacked with a complication of diſeaſes, followed him. The charge of the colony he committed to Capt. *Piercey*, of the *Northumberland* family, and under his care about 200 perſons in good health and well provided.

Before the return of his lordſhip, the council had ſent Sir *Thomas Dale* to act under him as high marſhal, with three ſhips, men, and cattle, who arrived ſafe at *Virginia* the 10th of *May* 1611, and having examined *James-River* up to the *Falls*, conſtructed a new town on the narrow of *Farrar's Iſland*, upon an iſthmus of the ſame riſing land nearly environed by the ſtream.

In the beginning of *Auguſt*, Sir *Thomas Gates* arrived with ſix ſhips, 300 men, and ſtore of proviſion, and Sir *Thomas Dale* in *September* built his new town, with a church and ſtorehouſes, which he paliſadoed round, and called it *Henrico*, in honour of the then prince of *Wales*, and peopled it with 350 perſons, and ſoon after built and fortified another town, about five miles from the former, and called it *New Bermudas*, within the pale whereof there was good cornland.

March 12, 1612, a new charter was granted the company for *Bermudas*, the former not extending ſo far from the coaſt, and Mr. *Richard Moore* was ſent governor with 60 men, on whoſe arrival they found the *Triumvirate* above mentioned in good health, but having firſt plundered them of their wealth, they then reduced them to the degree of common ſubjects.

In the beginning of this year, Capt. *Argal* arrived with a freſh ſupply, and ſoon after in the *Patowmac*-country, by a ſtratagem, got *Pocahentas* into his cuſtody, propoſing by her means to be upon better terms with *Powhatan*, her father, and declared enemy to the *Engliſh*; from that prince the damſel, for ſome reaſon unknown now, had fled to the *Patowmacs* with whom the *Engliſh* were in perfect friendſhip, by which means *Powhatan* was in the event content to treat of peace.

For a conſiderable time before this, Mr. *Rolfe*, a gentleman of good perſon and accompliſhments, had been in love with *Pocahontas*, and ſhe had a like affection for him; and a marriage being propoſed on the one ſide to Sir *Thomas Dale*, and on the other, to *Powhatan*, they were in *April* 1613 married by the mutual conſent of all parties, and a firm peace thereupon between the moſt potent of the *Indians* and the *Engliſh* eſtabliſhed, which proved a very lucky event.

Sir *Thomas*, about the ſame time, made peace with the *Chikihominys*, another potent *Indian* nation, a commonwealth, at war with *Powhatan* for their liberty, and by this means preſerved it, equally to the advantage of both parties.

Early in the year 1614, Sir *Thomas Gates* returning to *England*, Sir *Thomas Dale* was left ſole governor of all the colonies, and having information that the *French* were ſetling ſomewhere to the northward about the bay of *Fundy*, he diſpatched thither Capt. *Argall*, who, on his arrival, finding the *French* diſperſed in the woods, took the ſhip they came in, and a bark with all their apparel and proviſion. In his return to *James Town*, he put into *Hudſon*'s river, to viſit the *Dutch* ſettlements there. The governor, temporiſing, acknowledged the *Engliſh* right; but in the latter end of the year fortified themſelves better, and then inſiſted on holding the ſettlement. Mr. *Hamar*, who had been in the colony near four years, propoſed, the better to conſolidate their friendſhip with *Powhatan*, to inter-marry with another, and his only remaining daughter, and for that purpoſe Sir *Thomas Dale* entered into treaty with that prince, which however had not the happy effect propoſed.

Captain *Smith*, of whom ſo much has been ſaid, this year made a voyage to that part of the more northern coaſt, diſcovered by Capt. *Goſnold*, and having made it advantageous to his owners, and taken an exact ſurvey, he called it *New England*.

Pocahontas was the ſame year baptized at *James Town*, by the name of *Rebecca*; ſhe was the firſt chriſtian *Indian* of theſe parts, and, as my author ſays, perhaps the moſt worthy that has ever been ſince, her affection to her huſband extremely conſtant, and on his part to her in every reſpect reciprocal.

1615. The colony being now in an eſtabliſhed and flouriſhing ſtate, a lottery was drawn in *England* for farther encouragement; and the ſame year a large *Spaniſh* ſhip was perceived hovering on the coaſt, and deſiring a pilot, a boat was ſent with one, whom they carried off to *Spain*, and there offered him great reward, tho' in vain, to betray the colony. It appeared afterwards, that ſeveral ſhips were at ſea with intent to ſurprize it, but they never appeared.

1616. Sir *Thomas Dale* having adjuſted every thing to his ſatisfaction and of thoſe he governed, and having appointed Mr. *George Yeardly* his deputy, he embarked with *Pocahontas* and her huſband, and ſeveral young *Indians* of both ſexes; and on the 12th of *July*, they all arrived ſafe at *Plymouth*.

Hitherto this colony had been governed by a kind of martial law, but, by a change brought about in the council at home, the people were reſtored to the enjoyment of their native rights, by the means of Sir *Edwin Sandys*, who ſucceeded Sir *Thomas Smith* in the treaſurerſhip; and there being now about 600 induſtrious perſons, compleatly armed, and well ſtored with proviſions, with a large ſtock of live cattle of all kinds, fine crops of corn on the ground, and the *Indians* either drove far off from their ſettlements, or in firm peace with them, I ſhall here quit, for the preſent, this branch of our hiſtory,

After *John Cabot* had made a general diſcovery of ſo much of *North America* as has been premiſed, his ſon, *Sebaſtian*, who had attended him in that expedition, conceiving from the ſtructure of the globe a ſhorter courſe to the *Eaſt-Indies* than by the Cape of *Good Hope*, made a voyage to the *North Weſt*, hoping to find a paſſage that way, preſuming that he ſhould firſt fall in with the coaſt of *Tartary*, but was ſurprized to find himſelf interrupted by the intervention of *Newfoundland*, which however ſailing round, and ſo on to the coaſt of *Labarador*, which he traced to the height of 56 degrees, and then finding the land bend away to the eaſtward, he gave over his deſign, and returned to *England*.

In 1576, Sir *Martin Frobiſher* purſued the ſame courſe, and made ſome farther diſcoveries. But neither in that, nor two ſubſequent voyages to any purpoſe, as to the paſſage in view, and therefore declined the further proſecution, having only led the way to our future ſettlement in *Hudſon*'s *Bay*.

In 1585, Capt. *Davis* purſued the ſame courſe, and in two other voyages, as to the main deſign, much to the ſame purpoſe, but carried on his diſcoveries as far as the latitude of 72-12, on the weſt ſide of *Greenland*.

In 1602, another voyage this way was attempted by Capt. *George Weymouth* to little purpoſe, and in the year 1607, Capt *Hudſon* undertook to make further diſcoveries, he reached the latitude of 82 and returned; after two other voyages, in hopes of doing ſomething by the north-eaſt, he quitted that purſuit for the preſent, and having diſcovered and ſold *New York* to the *Dutch*, as previouſly mentioned in the ſetling of *Virginia*, in the year 1610, he made one other attempt to the north-eaſt, and in the courſe of his purſuits happened on the ſtreights that lead into *Hudſon*'s *Bay*, which having paſſed and thoroughly ſurveyed, his men mutinied and left him behind, from which time he was never heard of; but it is from hence we more eſpecially claim and fix our data of thoſe ſettlements; tho' no *charter* granted until *May* 1670.

Thus we plainly extended our diſcoveries far to the northward of any the *French* ever attempted, ſo their claim to *Canada* comes next in queſtion. They ſay themſelves, that their firſt diſcoveries of that country was by *Verazi*, under *Francis* I. in 1525; but his diſcoveries were ſuch only as had been made before, and no farther to the northward than the latitude of 40, which neither interferes with *Canada* or *Accadia*. The next diſcoverer, they ſay, was *James Cartier*, in 1534, he ſailed up the river St.

Laurence, but having loſt many of his men, returned to *France*, and it was not until the year 1608, that any ſettlement was made, when Monſieur *Biencourt* carried over ſome people whom he landed in *Accadia*, and being drove from thence by the *Engliſh* ſeizing their ſtores, as mentioned in the account of *Virginia*, they moved to the river St. *Laurence*, and ſeated themſelves on the other ſide where now *Quebec* ſtands.

In 1626, when the foundation of that city was hardly laid, the ſame was attacked and deſtroyed by the *Engliſh* under admiral *Dawit*, in proſecution of their juſt claim even to *Canada*, and here probably had all our future diſputes on this ſide ended, had not the admiral impolitically permitted ſome of the *French* to remain there, and prince *Charles* marrying a daughter of *France*, the country with ſome part of *Accadia* was ceded to that crown, which ceſſion afterwards coming in queſtion as an appurtenant of the *crown* of *England*, the ſame was for that reaſon by *Oliver Cromwell* reclaimed, and all that had been ceded of *Accadia* re-aſſumed and repoſſeſſed.

ACCADIA had been chartered in 1622 to Sir *Alexander Stirling*, but he being outed by the above ceſſion, he conveyed his right to one *de la Tour*, a *French* reformiſt, who having been put in poſſeſſion by *Cromwell*, *de la Tour* again conveyed his right to Sir *Thomas Temple*, from whom it is ſaid regularly to deſcend to the preſent Earl *Temple* as heir of the late Lord *Cobham*.

However the *French*, after *Cromwell*'s demiſe, found means to reſettle the colony about *Port Royal*, ſince called *Annapolis*, and continued until after the revolution, and in 1690, we find them increaſed to 6000—when they were attacked by Sir *William Phips*, and *Port Royal* utterly deſtroyed; but after permitting as many to retire to *Canada* as he thought proper, and as I ſuppoſe not knowing better what to do with the reſidue, he permitted them to remain, on taking the oath of allegiance to the crown of *England*. The ſame officer made a vain attempt on *Canada*, and being returned unſucceſsful, the *French* governor of *Canada* in *November* 1691, re-aſſumed the poſſeſſion of *Port Royal*, and held it until 1610, when it was again taken by Colonel *Nicholſon*, and by the 12th article of the *treaty* of *Utrecht*, the whole country of *Accadia* was ceded to the *crown* of *Great Britain*.

Here then is not only the firſt diſcovery, but what the lawyers call a continual claim on both *Accadia* and *Canada*, and the former being ſo abſolutely and formerly ceded, it remains only in reſpect to the latter to be conſidered, whether, except by poſſeſſion well ſecured, the *French* have really any right to that colony. I am ſenſible of the virtue of poſſeſſion, but even allowing this ſome face of right againſt continual claim, it will hardly extend that right to the back of our ſettlements, and give them even a fair pretence to intervene between them and the great weſtern ocean, conſequently, if we have power and right together, we have a fair pretence to impede their proceeding without any breach of friendſhip on our part. That the *French* would communicate with *Louiſiana* that way if they could, no one doubts, ſo they would, no doubt, with *Perſia*, and their *India* ſettlements by *Egypt* or *Ruſſia*, if the reſpective powers would permit them; but what this has to do with matter of right is not eaſily comprehended, eſpecially when in argument they have no better claim to *Louiſiana* than to *Canada*; and then it remains for them to ſhew, under what pretence, except their own convenience, they would interrupt our trade to the *Lakes*, and ſo on backward.

It follows from this ſeeming digreſſion, that as the *French* have only a claim to *Louiſiana* and *Canada* by *poſſeſſion*, and it appears, our ſettlements are both from *poſſeſſion* and *diſcovery*, which I think is by none doubted, it is plain we have the beſt right to the back-country, and having means to ſupport that right, it is a kind of duty we owe to ourſelves, to preſerve it by the beſt means in our power, without being preſumed, in any ſenſe, the aggreſſors in caſe a war ſhould enſue. The *French* may move in a line as far weſt as they pleaſe, either from *Louiſiana* or *Canada* for any thing it concerns us, and why the *Engliſh* may not purſue the ſame courſe, lies upon our adverſaries to make out in the beſt manner they are able.

It is upon this plan then that we propoſe to adjuſt the *geography* of *America*, and to determine the limits or boundaries of the reſpective nations, without regard to partiality on either ſide, that is to ſay, by the ſouthern boundary of St. *Laurence* at the entrance, and the northern of *Miſſiſipi*, and carrying them lines on due weſt, within thoſe limits to the great weſtern ocean, bound the *Britiſh empire* in *America*, *Hudſon*'s-*bay* excepted, and leave the *French* as much northern, or ſouthern, from the reſpective lines, as they may have any kind of claims. And here we return back to conſider the progreſs of our other ſettlements, ſo far as is neceſſary to give the reader a clear idea, and to eſtabliſh in his mind a regular geographical diſtinction of the rights, intereſts, and claims of *Great-Britain* and *France* in conteſt.

Newfoundland we not only find diſcovered, as has been mentioned, but alſo poſſeſſed, and three of the natives here in 14 *Henry* VIIth, and this confirmed by a variety of concurrent circumſtances, and without deducing the ſame down to the *Calvert* family, and thence to the preſent time, that right is immemorially confirmed by the *treaty* of *Utrecht* and *Aix la Chapelle*.

This neceſſarily leads us to *New England*, as the next province in courſe: this being under the direction of the *North Virginia charter*, was rather traded with than ſettled until the year 1619, when a congregation of *Engliſh ſectaries* being for liberty of conſcience reſident in *Holland*, having heard of *America*, and preſuming they might live there free from all kind of perſecution. For this purpoſe they firſt obtained the *king's licence*, and next agreed with the *North charter-counſel* for lands in *Nova Scotia*; but being afterwards better informed, they engaged for a ſettlement farther to the ſouthward, intending for *Hudſon's river*, but were by the conduct of the maſter of the ſhip who carried them over, ſeated near *Cape Cod* in the latitude of 42, and there built new *Plymouth*, and this is the foundation whereon has been ſuperſtructed that great and thriving *colony* of *New England*.

The next, in courſe, is *New York*, diſcovered and ſold, as has been ſaid before, by *Hudſon* to the *Dutch*, and by them ſettled, and in the latter end of the year 1664 conquered by the *Engliſh*, and ſo reduced again to the firſt right, as it ſtill continues, and with it all the *eaſt* and *weſt Jerſeys*.

Penſilvania, the next ſouthward, was granted by charter 1680 to Mr. *Penn*, and great numbers of perſecuted ſectaries going over the ſame year, in 1681 he went in perſon, and having, beſides the right of his charter, purchaſed the lands wanted of the natives, which is ſtill the ſtanding rule of the colony, and the numbers going over being many more in the time than to any other, it proſpered accordingly, and is now nearly on a footing with *New England*, though ſettled ſo many years before.

Maryland, the next, remained until 1632 as a part of *Virginia*, when *Calvert*, *Lord Baltimore*, having reſigned a *patent* which he had obtained for *Newfoundland*, had this country granted him, he ſent over his brother, *Leonard Calvert*, with ſome *Roman catholic* gentlemen and other adventurers, who, on the 22 of *November* 1633 arrived there, and ſeated themſelves, with the conſent of the natives, at the mouth of a river, falling into that of *Potowmac*, which infall they called St. *George's river*; they there conſtructed the town of St. *Mary's*, and ſoon became a flouriſhing colony, as by this time, was that, now diſtinctly called *Virginia*; ſo that the next in order, as they are ſituate, is *North Carolina*.

This province, and that adjoining called *South Carolina*, tho' originally the diſcovery of the *Cabots*, for the crown of *England*, as has been ſhewn before, was attempted firſt to be ſetled by the *Spaniards*, then by the *French*, and at length, after various conteſts, abandoned by both, and the *northern province* in ſome meaſure ſetled by the *Engliſh* from *Virginia*; and in 1663 both provinces were granted by *Charter* to Lord *Clarendon* and others, between the latitudes of 31 and 36, and backwards to the *South Seas*. It was by the proprietors in 1728 ſurrendered to the crown, except one eighth reſerved to Lord *Carteret*, now Earl *Granville*, and is become a very flouriſhing colony.

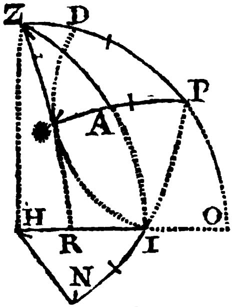
In reſpect to *Georgia*, the laſt ſetled of all our colonies, it may ſuffice to ſay, that it is within the bounds of our firſt diſcoveries, and of the *Carolina* limits; that we have made it our boundary to the *South*, and that it covers *Carolina*: That the charter was granted in 1732, and this, like moſt new colonies, was long eſtabliſhing; but it is hoped will now prove a uſeful barrier of the *Britiſh Empire* in *North America*, tho' not conſtructed on ſo wiſe a *Plan* as *William Penn*'s colony. And here I ſhall beg leave to make one concluſive obſervation; That however it is ſaid, that in the multitude of counſellors is ſafety; yet is it certainly true, that in the proſecution of any great deſign, civil or military, one good head in the ſcene of action is of more value than one hundred at a diſtance; and ſuppoſe with that head there is a pure and upright mind.

And thus having compleated my SUMMARY of diſcovery and ſettlement by the *Engliſh* in *America*, as far as reſpects our preſent diſpute with *France*, I propoſe, in my next chapter, to give a like *ſuccinct* Account of the ſtate, and geography of this extended country, with ſome particulars neceſſary to elucidate our rights, and ſhew, that it is in our power, and evidently our intereſt to uſe that power, in ſuch a warm and judicious purſuit of our claim, as may for the future put an entire end to all foreign pretenſions.

(To be continued in our next.)

MATHEMATICAL QUESTIONS *Anſwered.*

Queſtion 11, *anſwered by Mr.* T. STREET *of* London.



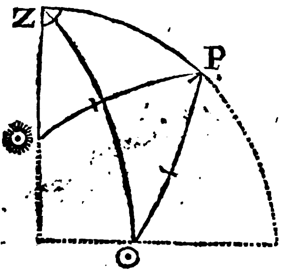
THE declination of the Moon at the time of obſervation was $18^\circ 30'$ N. nearly. And by the new property in *April Mag*. p. 56, as ſine I N : ſine angle N H I :: radius : co-ſine of the true amplitude $= 71^\circ 30'$ North Eaſt, and $71^\circ 30' - 70^\circ 0' = 1^\circ 30'$ the variation of riſing eaſterly. Again, As ſine Z P : radius :: ſine ✱ P : ſine true greateſt azimuth $= 71^\circ 36'$, and $72^\circ 0' - 71^\circ 36' = 0^\circ 24'$ Weſt variation at the time of greateſt azimuth. From which it appears that the needle had fluctuated $1^\circ 30' + 0^\circ 24' = 1^\circ 54'$ between the times of obſervation.

We have received no true anſwer to this queſtion, but the above.
Mr. Wildbore *attempted a Solution, but without Succeſs.*

Queſtion 12, *anſwered by Mr.* CHARLES WILDBORE *of* Nottingham.

LET $q =$ the S. of the declination, $t =$ tangent of $9^\circ 30'$, alſo x and y = the ſine and co-ſine of the latitude of the place: Then (*per* ſpherics) $\frac{y}{x} : 1 :: q : \frac{xq}{y} =$ the tangent of the aſcenſional difference, and as $\frac{x}{y} : 1 :: q : \frac{yq}{x} =$ the tangent of the time from 6 to due Eaſt, their ſum, or $\frac{q}{xy - xyq^2} = t \therefore xy = \frac{q}{t - q^2 t}$, which ſolved gives the latitude required.

The PROPOSER'*s Anſwer.*



PUT x, and y, for the ſine and coſ. of half the ∠s ⊙ P Z, and ☼ P Z; m, n, ſine and coſ. half their difference = half ⊙ P ☼; $s =$ coſ. ⊙ ☼; $p =$ ſine P ⊙, comp. declinat. Then ⊙ Z, and P Z ☼, being each $= 90^\circ$, we ſhall have $nx - my =$ S. ⊙ P Z; and $nx + my =$ S. ☼ P Z: in the △ ⊙ P Z, we eaſily get $pnx - pmy =$ S. P Z ⊙; and in the △ ⊙ Z ☼, the coſ. ⊙ Z ☼ is found $= \frac{s}{pnx + pmy} =$ ſine P Z ⊙; conſequently $\frac{s}{pnx + pmy} = pnx - pmy$.

By reduction $x = \overline{m^2 + \frac{s}{p^2}}\Big|^{\frac{1}{2}} = 0.9998321 =$ ſine $91^\circ 3'$; from which the latitude (being the compt. Z P) is eaſily found $= 51^\circ 22' 12''$.

Queſtions

New QUESTIONS *to be anſwered.*

Queſtion 24. *By Mr.* JOHN ASH.

SUppoſe a ſpherical body, perfectly elaſtic, to fall freely, by the force of its own gravity, from the height of a 1000 yards, on the ſmooth ſurface of a firm rock, whoſe inclination to the plane of the horizon is 15°. Its greateſt velocity, the diſtance of its ſecond deſcent on the ſame plane, and the whole time of its continuance in motion are required?

Queſtion 25.
By Mr. J. FISH *of* Crowl.

WHat dimenſions muſt I give to a Joiner, to make a cubical box that will hold 2000 oranges of $2\frac{1}{2}$ inches diameter each; ſuppoſing oranges globular, and to keep that form?

Queſtion 26.
By Mr. J. GILES *of* Graveſend.

IN taking an angle with the Theodolite on the ſide of a hill: if the plate of the inſtrument dip four degrees under the horizon, or true level, at right angles to the line of obſervation, and the hill deſcend ten degrees; what error will it cauſe in the angle, and how many links will the object be thrown out of its true place at the diſtance of ten chains?

Queſtion 27.
By Mr. BAMFIELD *of* Honiton.

IF I borrow 100*l.* for the ſpace of one year, or 12 months, and at the end thereof am to give 5*l.* for the ſame: What muſt I pay, according to the ſtrict Rules of art, if I uſe the money but one Month?

Queſt. 28. *By Mr.* J. LIDDELL.

TWO bodies C and D, proceed from a given point A (*i. e.* A N = 10) above the right line E F, in order to meet with E F in any given time t, whoſe ſpaces A E + A F deſcribed thereby = 35, and their diſtance E F in the interſection = 29. *Quære*, how much are the lines A E and A F reſpectively, and the angles of inclination, with the velocity of each body?

Queſtion 29.
By Mr. JOHN SHIPMAN.

GIven the neareſt diſtances a and b from A and C, the two acute angles of a right angled triangle, to the circumference of the inſcribed circle; to find the triangle and circle?

Queſtion 30.
By Mr. JO. GOODHEAD *of* Nottingham.

GIven the convex ſuperficies of the ſegment of a globe $= 1256{,}64 = s$, and that of its circumſcribing cylinder $= 1206{,}3744 = c$, required the diameter of the globe?

Queſtion 31. *By* MECHANICUS.

SUppoſing all the Planets, at any given time, ſhould ſtart from a line of conjunction with the Sun in any point of the ecliptic; in what time will they all be in conjunction again, either in the ſame point, or any other; and how many revolutions will each Planet make before they come all in a line again?

Queſtion 32.
By Mr. JAMES HEMINGWAY *of* Norwich.

HAving a Line of Hurdles $BD = a = 75$ fixed, and a moveable one $BC = b = 45$, thence to find how many Hurdles in a Line $CD = x$ will, with the other two Lines, incloſe 1 Acre, 0 Rood, $18\frac{62}{141}$ Poles?

Queſt. 33. *By Mr.* C. WILDBORE *of* Nottingham.

IT is required to find the values of x, y, and z, when $x^4ya^3 + az^3 - y^3a^2 + 4a^4z$ is a maximum?

JOVE's *Deciſion: Or,* MINERVA *and* VENUS *eclipſed.*

AS on a bank near ſome fair ſtream I ſtood,
Pleas'd to ſurvey the clear tranſparent flood,
That flow'd, meandring, thro' a verdant mead,
Whoſe gaudy flowers around ſweet odours ſpread;
Methought I heard *Minerva* thus exclaim,
And often call on *Jove*'s tremendous name:
"Shall impious mortals treat me thus with ſcorn?
Think you, by me this uſage can be borne?
Erſt was I preſident of learning ſtil'd;
Why am I then thus treated, thus revil'd?
Long ſince to me the ſage has tribute paid;
I've been, 'till now, as wiſdom's ſource obey'd;
Then tell me, *Jove*, this ſudden change declare,
Pronounce the cauſe, for I'm prepar'd to hear."
Thus anſwer'd *Jove*, "By pride you was undone;
'Twas pride, *Minerva*, brought thy ruin on:
Long has [*] *Eliza* bright, unrival'd, been
The darling favourite of Gods and men:
Eliza's wiſdom has eclips'd your pow'r,
But haughty pride ſhe does not boaſt; no more
Shall mankind ſeek for wiſdom at your ſhrine,
But hence that praiſe, *Eliza*, ſhall be thine."
Thus, to *Minerva*, ſpoke the angry God;
With rage ſhe glow'd and vaniſh'd at his nod.
Bright beauty's goddeſs, *Venus*, next appear'd,
And *Jove*, omnipotent, with awe rever'd.
Her jetty hair in waving treſſes flow'd,
Her eyes, her breaſts, her mein amaz'd the God.
She aſk'd, "Why men her beauty did diſown,
Nor paid, as erſt, their tribute at her throne?
Why ſhe, who oft in lover's lays was ſeen,
Call'd by the name of beauty's mighty queen,
To whom of right all honour did belong,
Was found no more to grace the poet's ſong?"
To which great *Jove* thus readily reply'd;
"The cauſe is plain, and eaſy to decide:
Know, *Venus*, then, from hence proceeds that ſcorn,
The blooming, peerleſs *Colcheſter* is born.
Your fading beauty droops, and ſoon decays
Beneath her charms that more refulgent blaze;
Therefore with her contend in vain no more,
But pay obeiſance to ſuperior power."

Southampton,
April 26, 1755.

W. A.

An IMITATION *of Dr.* YOUNG's *Stile.*

WHat ſubject ſhall a youthful poet chuſe
For the firſt efforts of a virgin muſe?
Shall he in fancy's maze bewilder'd ſtray,
And wanton careleſs in the flow'ry way?
Or ſhall he wake to manlier ſtrains the lyre,
And ſing as truth and virtue may inſpire?
But ſing to whom? The learned, or, the great?
Theſe have no wit, and *thoſe* have no eſtate.
Do what he will, the poet's caſe is hard;
One cannot read, and t'other can't reward.

Ch. Condill.

TRANSLATION *of Mr.* WALLER's THYRSIS, *a Youth, &c.*

By Mr. HACKETT.

AVerſâ ſolam Sachariſſam virgine tædas
Thyrſidis infauſtus deperiebat amor.
De grege Pieridum, velut alter *Apollo* canebat
Ille, imitabatur *Daphnidis* illa fugam.
Thyrſidis ad morem, cui mens rapit ignea flammas,
Per ſaxa, et rupes it, duce amore, puer.
Thyrſis, abeſt neque enim lateri lethalis arundo,
Per montes damas, rura per antevenit.
Jam fugienti inſtat. Nympham non formæ ſequentis,
Sed docet auritam carmen inire moras.
Omnes, ſi excipias unam, miſerantur amantis,
Mira omnes numeris Suada, fatentur, ineſt.
Inveniens laudes, quas non ſperârat, amorem
Ambiit, et lauros carpſit, *Apollo*, tuas.

C. Condhill.

An EPIGRAM, *by* R. LEWIS.

PAinters, of old, who ſkilful were,
An hundred eyes to *Argus* drew;
But what a wonder, heav'ns! is here,
Nell ſees an hundred ways with two.

An Hymn to SLEEP, *in a Night of Sickneſs.*

HAil! kind aſſuager of my wretched hours,
Who lulleſt all my pains in gentle reſt,
My ſpirit wafting to the roſy bowers
Where health ſerene revives the happy Gueſt:
How can'ſt thou lead me from the ſickly gloom
Of burning *Febris*' ſad malignant cell?
How from the dreary portal of the tomb,
To peaceful manſions, where the happy dwell?

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[*] *Miſs* Colcheſter, *of* H—b—e, *in the County of* Southampton.

In thy ſoft arms embrac'd, I feel no more
The ſinking terror nor the ſighs of grief;
But view the ever-bleſt *Elyſian* ſhore,
And hear the *Seraphs* ſing to my relief.
Or, loſt to ſenſe, oblivion wraps me round;
Releas'd from all the labours of the day:
So death remains, and is but reſt profound,
When life, and care, and toil are fled away.
O! when ſhall I from this low earth remove,
To where the learned cannot here define,
A glorious immortality above,
Into a world inviſible as thine?

April 16, 1755. *J. Walſh.*

To CORNELIA.

WHEN, my *Cornelia*, *Flora*'s beauteous train,
Shall droop its head, by gentle ſhow'rs of rain,
Shall bloom at night, its colours fade by day,
Or vegetation hate *Apollo*'s ray:
When little ants ſhall induſtry abhor,
And anxious ſeek the ſcatter'd grain no more;
Break thro' their laws and anarchy embrace,
And each laborious emmet meet diſgrace:
When Bees along the aromatic grove,
No more with penetrating eyes ſhall move,
Or eager in the gay enamell'd vale,
The ſcented flow'r with buzzing noiſe aſſail;
Their ſlender thighs no more with honey bleſt,
But they the garden's product ſhall deteſt:
When little lambs, no more by mirth impell'd,
With ſporting innocence ſurround the field;
But ſavage turn'd, ſhall ſullenly explore
Each loneſome grove, embrew'd with clotted gore:
When *Jove*'s great bird ſhall in the valleys droop,
Nor on the prowling hawk with juſtice ſtoop;
Nor longer then, with elevated flight,
In higheſt air attract the human ſight;
Shall from the glorious ſun direct his view,
And pitchy darkneſs eagerly purſue:
When the huge whale from *Zembla*'s gelid tides
In *Ormus*', gulph ſhall lave his glowing ſides,
Shall the vaſt depth's eternal coldneſs ſhun,
And on the ſurface hail the genial ſun;
When all that this terraqueous ball contains,
Attraction's pow'r and gravity diſdains;
Or when the ſtars in ſilent order roll,
Scorn nature's laws and move to either pole;
The planets in their orbits ceaſe to move,
And dire confuſion's pow'r extend its reign above:
Then, and then only, in that hapleſs hour,
Shall your *Conſtantius* ceaſe your charms t'adore.

Conſtantius.

On Sir ISAAC NEWTON.

THE plan of *Ptolemy*, and *Tycho*'s ſcheme,
Are now no better than an idle dream;
Newton aroſe, ſhew'd how each planet mov'd,
And what they wand'ring call'd he conſtant prov'd:
Founded on truth his problems ſtand ſecure,
And with the ſun his Syſtem ſhall endure.
He was the firſt that could unerring trace
Each orbit thro' immenſity of ſpace;
Where comets thro' the void revolving flow,
Their courſe oblique and ſettled period know:
Guided by him when we ſurvey the whole,
Worlds beyond worlds which by him meaſur'd roll,
And with the grand idea fill the ſoul.
What is this point of earth; this mortal ſeat?
How little this appears, and he how great!

To the Right Hon. Miſs T—R—SIA M—CK—ZIE, *on her Return from the* South *of* France.

I.

WHen *Phœbus*, roſeate God of day,
Viſits more ſouthern ſkies;
All nature mourns his abſent ray,
Droops, ſickens, fades, and dies.

II.

But when his radiant courſe anew,
Bends to our weſtern main:
The fields aſſume a livelier hue,
And nature ſmiles again.

III.

Thus in *M—ck—zie*'s brighter eyes
A various fate prevails:
Chearleſs, if ſhe their light denies,
But bleſt beneath their ſmiles.

Gubznf.

DORINDA, *an Elegy.*

YE ſwains, that tend your fleecy care,
Ye ſportive nymphs, that wanton are,
Ye flow'ry banks, that verdure ſhed,
Droop, droop your heads, *Dorinda*'s dead!
Alas! what nymph could equal boaſt,
Her lovely charms, for ever loſt;
Her rolling eye, that beauty ſhone;
The lilly with the roſes grown;
The ſhape with ev'ry freedom crown'd,
And in each place proportion found;
The pleaſing ſmile, the graceful air,
That caus'd the envy of the fair.
Alas! how fleet are all our joys,
When death ſo ſoon our hope deſtroys!
To day the promis'd bud appears,
The mournful yew to-morrow rears.
Whene'er ſhe talk'd, the groves around,
Wou'd echo ſoft the pleaſing ſound,

The moſſy bank, the purling rill,
The flow'ry mead, the riſing hill,
Wou'd doubly pleaſe the wand'ring eye,
By nature dreſt in gay variety;
Ev'n winter's ſtorm wou'd mild appear,
And ſummer reign through out the year.
But ah! how chang'd the pleaſing ſcene,
Since you, *Dorinda*, left the green!
No more the bank or purling rill,
The flow'ry mead or riſing hill,
Can pleaſe, or former beauties ſhow,
Unleſs to kindle freſh our woe.
But winter's ſtorm o'er all abounds,
And ſpring, and ſummer knows no rounds:
Eternal froſt, with aged care,
And with'ring envy, with diſpair,
Triumphant reign in youthful breaſts
Alone, the ſad, but welcome gueſts.

HORACE. ODE XXXI.

The Poet's Prayer.

WHEN at the conſecrated ſhrine
The ſuppliant bard intreating ſtands,
And from his goblet pours the wine,
What does he beg at *Phœbus'* hands?

No plenteous harveſts, that array
Sardinia's fields with bending grain;
No kindly herds, that pleaſing ſtray
On hot *Calabria's* ſunny plain.

No ſhining gold or iv'ry craves,
Or ought of *Inda's* coſtly pride;
No lands, where ſilent *Liris* laves,
With ſoaking flood, its fertile ſide.

Let thoſe, to whom kind *Fortune* ſhares
Calenian vineyards, prune the vine;
Rich merchants change their *Syrian* wares,
And drain their golden cups of wine.

(The merchants, heav'n's peculiar care,
Or elſe their veſſels ne'er cou'd roam
Th' *Atlantic* ocean thrice a year,
And thrice return in ſafety home.)

Olives and mallows deck my board,
The wholeſome vegetable kind:
O, let me thus alone be ſtor'd
With health of body, health of mind!

When old, not deſpicable grow;
Be able ſtill to tune my lay;
On others, other gifts beſtow,
O, *Phœbus*, this is all I pray!

By the deſire of ſeveral of our Subſcribers we inſert the following.

PROLOGUE: *ſpoken by Mr.* GARRICK, *in the Character of a Sailor, fuddled, and talking to himſelf. He enters, ſinging,*

How pleaſant a ſailor's life paſſes——

WELL, if thou art, my boy, a little mellow;
A ſailor, half-ſeas o'er—'s a pretty fellow!
What chear ho? *do I carry too much ſail?
* *to the pit.*
No—tight and trim—I ſcud before the gale.*
* *he ſtaggers forwards, then ſtops.*
But ſoftly tho'—the veſſel ſeems to heel:
Steddy! my boy—ſhe muſt not ſhew her keel.
And now, thus ballaſted—what courſe to ſteer?
Shall I again to ſea—and hang mounſeer?
Or ſtay on ſhore, and toy with Sall and Sue—
Doſt love 'em, boy? By this right hand, I do.
A well-rigg'd girl is ſurely moſt inviting:
There's nothing better, faith,—ſave flip and fighting:
I muſt away—I muſt—
What! ſhall we ſons of beef and freedom ſtoop,
Or low'r our flag to ſlavery and ſoop?
What! ſhall theſe parly-vous make ſuch a racket,
And I not lend a hand, to lace their jacket?
Still ſhall old *England* be your *Frenchman's* butt?
Whene'er he ſhuffles, we ſhould always cut.
I'll to 'em, faith,—avaſt—before I go—
Have I not promis'd *Sall* to ſee the ſhow?
Pulls out a play-bill.
From this ſame paper we ſhall underſtand
What work's to night—I read your printed hand.—
Firſt let's refreſh a bit—for faith, I need it—
I'll take one ſugar-plumb*—and then I'll read it.
* *Takes ſome tobacco.*
He reads the play-bill of Zara, *which was acted that evening.*
At the the-atre royal—*Drury-lane*—
will be preſen-ta-ted a tragedy called—
SARAH.
I'm glad 'tis *Sarah*—then our *Sall* may ſee
Her name-ſake's tragedy: and as for me,
I'll ſleep as ſound, as if I were at ſea.
To which will be added,
a new maſque.
Zounds! why a maſque? We ſailors hate grimaces:
Above-board all, we ſcorn to hide our faces.
But what is here, ſo very large and plain?
BRI-TA-NIA—oh *Britania!*—good again—
Huzza, boys!—by the *Royal George* I ſwear,
Tom coxen, and the crew, ſhall ſtrait be there.
All free-born ſouls muſt take *Bri-ta-nia's* part,
And give her three round cheers, with hand and heart. [*going off, he ſtops.*
I wiſh you land-men tho', would leave your tricks,
Your factions, parties, and damn'd politicks:
And like us, honeſt tars, drink, fight, and ſing:
True to yourſelves, your country, and your King.

Errata in No. V. *Miſcellaneous Correſpondence*, p. 74, l. 14, *for* periphery height, *read* perpendicular height: p. 74, l. 19, *for* 21 Yds. 5 In. *read* 21 Yds. 25 In.

A CHRONOLOGICAL MEMOIR *of* Occurrences.

For *JUNE*, 1755.

Turkey.

ABove 80,000 Workmen were daily employed in April laſt about making good the Damages, occaſioned by the late dreadful Earthquakes that happened at Conſtantinople and the Parts adjacent. The Caſtle of the Seven Towers, and the Wall that was thrown down between the Port of Adrinople and the Arſenal, was finiſhed when the laſt Advices from thence came to England.

Poland. In April laſt, the whole Town of Brizeck, or at leaſt the greateſt Part of it, which belonged to Count Flemming, Great Treaſurer of that Province, was, by Fire, unhappily reduced to Aſhes.

Italy. For ſome Days ſucceſſively in April laſt, a Kind of thick Smoke had iſſued from Mount Veſuvius; from whence the Inhabitants round about it were apprehenſive of a new Eruption.

Mount Ætna, likewiſe, after ſmoaking for ſome time, on the 9th of March laſt, threw out a prodigious Quantity of Stones, which were ſoon followed by a hot, fluid Matter, which looked, when cold, like Sand calcined; and after that, a great Quantity of ſulphureous Matter ran flaming down the Mountain, and covered the Ground for a conſiderable diſtance.

On the 11th of May laſt, the famous Mandrin was ſeized in his Bed at Rochfort by a Body of Men, dreſſed like Peaſants and Labourers, but well armed, and prepared for any Oppoſition.

France. Marſhal Lowendahl died on the 27th of May laſt, at his Apartments in the Palace of Luxembourg, in the 55th Year of his Age, of a Mortification in one of his Legs, attended with a violent Fever.

Plantation News. By Advices from Virginia, dated April 16, we hear, that all the Governors on the Continent, with General Braddock and Commodore Keppel, had a Meeting at Annapolis a few Days before, when a Plan of Operations was concerted. They went afterwards to the Camp at Alexandria, and reviewed the Troops, which amount to about 6000 Men, all healthy and in high Spirits, who immediately after marched for Wills-Creek, where they are to wait for farther Orders. The Camp is plentifully ſupplied with Money and Proviſions of all Kinds.——By other Advices, ſince, we are aſſured, that all the Men of War and Tranſports from Ireland are ſafe arrived; and immediately thereupon they were ordered up to Alexandria, and from thence to Wills-Creek, to join the Virginia Forces.

LONDON.

May 23. BY a Letter from Portſmouth, we are told, that Sir Edw. Hawke, Vice-admiral of the White, and —— Weſt, Rear-admiral of the Red, remain at Spithead, and 26 Men of War, 19 of which are of the Line, in excellent Condition, and tolerably well manned. The Concourſe of People, of all Conditions, to ſee the Fleet, encreaſes; and the weekly aſſemblies at Portſmouth are extraordinary brillant.

The Parliament ſtands prorogued to Tueſday the 1ſt of July next.

On the 9th of June inſtant, his Grace the Duke of Marlborough, Lord Anſon, and the Right Hon. Henry Fox, Eſq; took the Oaths in the Court of Chancery, to qualify themſelves for Lords of the Regency.

June 12. Above 2200 Salmon were ſold at Newcaſtle Market, all taken that Morning in the Tyne. The like Quantity has not been taken in two Tides for theſe many Years laſt paſt.

16. His Royal Highneſs the Duke of Cumberland went in State to Weſtminſter Hall, and took the Oaths in the Court of Chancery, to qualify himſelf for firſt Lord of the Regency.

The famous Mandrin was executed the 26th of May laſt at Valence, in lower Dauphine, and was as remarkable for his decent Deportment, and ſincere Repentance for his paſt ill-conduct, as his invincible Intrepidity during his actual Tortures on the Wheel; ſince he promiſed his Father-confeſſor the Day before, that he would not ſhed a Tear on that Occoſion; and, it is ſaid, he punctually kept his Word, notwithſtanding he received nine ſeveral Blows in various Parts of his Body, before he was indulged his Coup de Grace; and notwithſtanding he was but 29 Years of Age at the Hour of his Execution.

Circuits appointed for the Summer Aſſizes.

WESTERN CIRCUIT.

Lord Chief Baron Parker, Mr. Juſtice Wilmot.

Southampton, Tueſday July 15, at the Caſtle of Wincheſter.
Town and County of Southampton, Saturday 19, at Southampton.
Wilts, the ſame Day, at New Sarum.
Dorſet, Thurſday 24, at Dorcheſter.
City and County of Exeter, Monday 28, at the City Guildhall.
Devon, the ſame Day, at the Caſtle of Exeter.
Cornwall, Tueſday Auguſt 5, at Bodmin.
Somerſet, Tueſday 12, at the City of Wells.
City and County of Briſtol, Saturday 16, at the City Guildhall.

NORFOLK CIRCUIT.

M. Juſtice Clive, Mr. Juſtice Birch.

Bucks, Monday July 7, at Buckingham.
Bedford, Thurſday 10, at Bedford.
Huntingdon, Saturday 12, at Huntingdon.
Cambridge, Monday 14, at Cambridge.
Suffolk, Thurſday 17, at Bury St. Edmund's.
Norfolk, Monday 21, at the Caſtle of Norwich.
City of Norwich, the ſame Day, at the City Guildhall.

OXFORD CIRCUIT.

Mr. Juſtice Forſter, Mr. Baron Smyth.

Berks, Saturday July 12, at Abingdon.
Oxon, Tueſday 15, at Oxford.
Worceſterſhire, Saturday 19, at Worceſter.
City of Worceſter, the ſame Day, at the City of Worceſter.
Staffordſhire, Thurſday 24, at Stafford.
Salop, Monday 28, at Shrewſbury.
Herefordſhire, Saturd. Aug. 2, at Hereford.
Monmouthſhire, Thurſd. 7, at Monmouth.
Glouceſterſhire, Saturday 9, at Glouceſter.
City of Glouceſter, the ſame Day, at the City of Glouceſter.

MIDLAND CIRCUIT.

Hon. Sir Thomas Deniſon, Knt. Hon. Heneage Legge, Eſq;

Northampton, Tueſday July 8, at Northampton.
Rutland, Friday 11, at Oakham.
Lincoln, Monday 14, at the Caſtle of Lincoln.
City of Lincoln, the ſame Day at the City.
Nottingham, Thurſday 17, at Nottingham.
Town of Nottingham, Friday 18, at the ſaid Town.
Derby, Saturday 19, at Derby.
Leiceſter, Wedneſday 23, at the Caſtle of Leiceſter.
Borough of Leiceſter, Thurſday 24, at the ſaid Borough.
City of Coventry, Saturd. 26, at the ſaid City.
Warwick, Monday 28, at Warwick.

HOME CIRCUIT.

Lord Ch. Juſt. Rider, Lord Ch. Juſt. Willes.

Hertford, Monday July 28, at Hertford.
Eſſex, Wedneſday July 30, at Chelmsford.
Kent, Monday Auguſt 9, at Lewes.
Surry, Wedneſday Auguſt 13, at Croydon.

NORTHERN CIRCUIT.

Mr. Baron Adams, Hon. Mr. Juſtice Bathurſt.

City of York, Monday July 14, at the Guildhall.
Yorkſhire, the ſame Day, at the Caſtle of York.
Durham, Wedneſday 23, at the Caſtle of Durham.
Newcaſtle upon Tyne, Tueſday 29, at the Guildhall.
Northumberland, the ſame Day, at the Caſtle of Newcaſtle.
Cumberland, Wedneſday Auguſt 6, at the Caſtle of Carliſle.
Weſtmorland, Tueſday 12, at Appleby.
Lancaſhire, Saturday 16, at the Caſtle of Lancaſter.

NORTH WALES.

Hon. Will. Noel, Ch. Juſt. Hon. John Talbot.

Montgomeryſhire, Wedneſday, Auguſt 6, at Poole.
Denbighſhire, Tueſday 12, at Wrexham.
Flintſhire, Monday 18, at Flint.
Cheſhire, Saturday 23, at the Caſtle of Cheſter.

SOUTH WALES.

Hon John Williams, John Harvey, Eſqrs.

Preſteign, Thurſday, Auguſt 7.
Brecon, Wedneſday 13.
Cardiff, Tueſday 19.

Bath. On the 21ſt of May, in the Night, Crickmore-mills, belonging to Iſrael Dunford, Jun. by Accident took Fire, which burnt with ſuch Fury, that the Mills, with the Dwelling-houſe, &c. were entirely conſumed. The Family very narrowly eſcaped being burnt in their Beds. By this Miſfortune, nothing being inſured, the unhappy Sufferers are reduced from a Competency to great Neceſſity and Diſtreſs.

Ireland, May 13. His Excellency the Lord Lieutenant was pleaſed to appoint the Rt. Hon. Lord Frederic Cavendiſh, Lt. Col. John Campbell, Lt. Col. George Jocelyn, Major James Giſborn, Capt. John Rutter, and Capt. Henry Boyle Walſingham, to be his Aid de Camps.—And Rob. Lowth, D. D. to be his firſt Chaplain. — The ſame Day his Excellency, attended by the Right Hon. the Lord Moleſworth, viewed the

Stores, Artillery, and Arms, in the Arſenal of Dublin-caſtle, and at his Departure expreſt an entire Satisfaction at the Order and good Condition of each Particular.

On the 17th of May laſt, at an Aſſembly of the Right Hon. the Lord Mayor, Sheriffs, Aldermen, and Common-council, the Freedom of the City of Dublin, in a Gold Box, was unanimouſly voted to his Excellency the Marquis of Hartington; and, at the ſame Time, the Freedom of the City was voted to the Right Hon. Henry Seymour Conway, Eſq; Secretary to his Excellency.

On the 21ſt of May his Excellency paid a viſit to the Univerſity of Dublin, where he was received with great Formality and Reſpect; and at the ſame Time the Degree of Honorary Doctor of Laws was preſented to him in a Gold Box.

On the 25th of May his Excellency ſet out from Dublin Caſtle to review the Forces and Garriſons in ſeveral Parts of this Kingdom, attended by the Earl of Rothes, Reviewing-general, Col. Conway, Principal Secretary of State, Lord Frederic Cavendiſh, Col. Campbell, and ſeveral other Officers of Diſtinction. —— Orders will be iſſued out very ſpeedily for an Encampment of 4800 Men in the Phœnix Park.

Drury-Lane.

May 15. *Love for Love.—Tom Thumb.*

16. *The Chances.—Britannia.*
19. *Henry* VIII.*—Proteus.*
20. No Play this Night.
21. *The Mourning Bride.—Britannia.*
22. No Play.
23. *King Lear.—Anatomiſt.*
27. *Barbaroſſa.—Britannia.*—The laſt for this Seaſon.

Covent-Garden.

The Merry Wives of Windſor.— Double Diſappointment.
The Double Dealer.—Scapin.
The Suſpicious Huſband.—Lying Valet.
The Committee.—Contrivances.
The Jubile.—Orpheus.
The Conſtant Couple.——Orpheus.—— The laſt Performance for this Seaſon.

The RURAL CALENDAR.

Vaux-hall. *This delightful Spot continues to be the Admiration, as well of Foreigners as the Reſort of all others, who have either Leiſure or taſte to frequent it. The Band of Muſic is a very grand one; and the vocal Performers give ſufficient Demonſtration, that it is Luxury, and Partiality only, that induced certain Perſons to encourage* Exotics.

Ranelagh. *What we have ſaid of* Vaux-hall *may, in a great meaſure, be applied to this elegant Place of Diverſion; and the Performances of Mr.* Beard *and Miſs* Young *cannot be too much admired.*

Sadler's Wells, Iſlington. *This Theatre (for ſuch it is) is ſo well regulated under the preſent Manager, that a better Company is not any where to be met with. The Performances of Miſs* Wilkinſon *are both juſtly and univerſally admired; and ſhe is attended to with great Pleaſure even by thoſe, who heretofore could not look upon Feats of this Kind with any Degree of Patience.*

Marybone. *Entertainments as uſual, except that they have added* Fire-works, *which, in this Place, have a ſingular Effect and Propriety.*

Births.

May 18. The Lady of —— Toftcroft, Eſq; Daughter of Sir John Ogilby, Bart. delivered of a Son.

21. The Dutcheſs of Ancaſter, of a Son and Heir.

22. The Lady of Lord Guernſey, of a Son.

24. Mrs. Thiſtlethwayte, of Tytherly in Hampſhire, of a Son and Heir.

June 6. The Wife of James Crake, of Richmond, Yorkſhire, of three Daughters, all likely to do well.

14. The Wife of Mr. Lloyd, an eminent Oilman in the Strand, of a Son and Daughter.

Marriages.

May 19. The Hon. Charles York, ſecond Son to the Rt. Hon. the Lord Chancellor, to Miſs Freeman of Hertfordſhire.

Charles Holte, Eſq; to Miſs Jeſſon.

22. Mr. Thomas Neale, Surgeon, to Miſs Baylis of Glouceſterſhire, with a Fortune of 5000 l.

Mr. Joſeph Richardſon, Bookſeller, to Miſs Molly Campden.

23. Philip Vivyon, Eſq; to Miſs Knight.

24. Davis Davenport, Eſq; to Miſs Phœbe Davenport.

Mr. William Forteſcue, Linnen-draper, to Miſs Judith Dickenſon, with a Fortune of 6000 l.

26. James Forſter, Eſq; Barriſter at Law, to Miſs Strange.

29. The Rev. Mr. Griffies, Rector of Chipſtead in Surry, to Miſs Thackeray, Daughter of the Rev. Archdeacon of Surry.

Mr. Tho. Green, jun. an eminent Maltſter, to Miſs Suſanna Maſon, with a Fortune of 4000 l.

Anthony Sawyer, Eſq; Nephew to Lord Feverſham, to Miſs Harcourt, with a conſiderable Fortune.

June 1. Mr. Robert Palmer to Miſs Wakelyn, with a conſiderable Fortune.

9. The Rt. Hon. John Earl of Glaſgow to the Hon. Miſs Betty Roſs, Daughter of the late Lord George Roſs.

12. John Carter, Eſq; Son of the Rev. Dr. Carter, to Miſs Underdown, Daughter and Heireſs of John Underdown, Eſq;

DEATHS.

May 8. Ambroſe Goddard, of Swindon in Wiltſhire, Eſq;

13. The Lady of Robert Dundas of Armiſton, Eſq; his Majeſty's Advocate for Scotland.

15. The Rev. Mr. Hudſon Martin, of Corſton in Wiltſhire.

19. Mrs. Vaughan, Wife of the Hon. Wilmot Vaughan, Eſq;

20. Dame Barbara Ward, Relict of Sir Edward Ward, Bart. late of Bixley, Norfolk.

Mr. James Oldfield, a Callicoe Printer, and his Wife ſome few Minutes after him.

21. Jaſper Wade, Eſq; formerly an Italian Merchant.

Thomas Henley, Eſq; Brother to Robert Henley Ongley, Eſq; Member of Parliament for the Town of Bedford.

23. Edward Mountley, Eſq;

Mr. Thomas Smith, ſen. Groom of his Majeſty's Stud at Hampton Court.

24. Hugh Cholmley, of Whitby, Eſq; late Surveyor of his Majeſty's Board of Works.

Henry Drax, Eſq; Member of Parliament for Wareham, Dorſetſhire.

25. Sir Charles Cheſter, Bart.

31. The Rev. Mr. Dubourdieu, Rector of Kirby Miſperton in Yorkſhire.

The Rev. Mr. Allen, late Vicar of Kettering, in Northamptonſhire.

Sir Henry Every, of Egginton, Derbyſhire, Bart.

Andrew Hill, Eſq; formerly Member for Biſhops-caſtle, Shropſhire.

June 1. William Clarke, Eſq; one of the principal Clerks of his Majeſty's Exchequer.

2. Dr. Francis Dickins, ſenior Fellow of Trinity Hall, and Profeſſor of Civil Law in the Univerſity of Cambridge.

3. The Lady of Anthony Keck, Eſq; Aunt to the Duke of Hamilton.

Henry Spelman, Eſq;

Alexander Mackenzie, Eſq;

Mr. Charles St. Eloy, a Proctor in the Biſhop of London's Court at Doctors Commons, and a Clerk in the Prerogative Office.

5. The Right Hon. the Marchioneſs of Granby.

6. Stephen Ryder, Eſq;

15. Felix Calvert, Eſq; of Furneux Pelham in Hertfordſhire.

Sir Richard Hilton, Bart.

17. The Rev. Mr. Bennet, Rector of Aldborough.

18. Thomas Longman, Eſq; Bookſeller, who, a few Years ſince, paid his Fine to be excuſed ſerving the Office of Sheriff of this City.

Civil and Military Preferments.

Mr. Edward Scovell appointed a General Surveyor of the London-Diſtillery.

Mr. Maſhader, Diſtillery-Surveyor; and Mr. Garrett Brandy-Stock-Surveyor.

Mr. Robertſon, F. R. S. Head Maſter of the Royal Academy of Portſmouth.

Mr. Stort, ſenior Groom of his Majeſty's Stud at Hampton Court, in the Room of Mr. Thomas Smith deceaſed; and Mr. James Gregory appointed the other Groom, in the Place of Mr. Stort.

Robert Rodham appointed Commander of the Greenwich at Spithead.

Mr. William Knight to be one of the Proctors of the Prerogative Court at Doctors Commons.

Mr. William Stubbs appointed one of the Clerks in the Prerogative Office, in the Room of Mr. Charles St. Eloy, deceaſed.

Mr. John Reed, one of the Common-council-men of Billingſgate Ward, appointed City Carpenter, in the Room of Mr. Cordwell, deceaſed.

Geo. Cuthbert, Eſq; Phyſician, and Mr. Gregory Carlos. Surgeon, appointed to have the Care of the ſick and hurt Seamen in the new Hoſpital at Haeſler near Portſmouth.

The Degree of Doctor of Civil Law was, on the 14th of this Inſtant June, conferred on the Rt. Hon. the Earl of Sherburne by the Univerſity of Oxford, in full Convocation.

ECCLESIASTICAL PREFERMENTS.

The Rev. Mr. John Ball, appointed one of the Earl of Lincoln's domeſtick Chaplains.

The Rev. Mr. Thomas Trimley, M. A. to the Rectory of Lullington in Cornwall.

The Rev. William Becket, M. A. to the Vicarage of Morden.

The Rev. Mr. John Scott, appointed Chaplain to his Majeſty's Ship the Greenwich, commanded by William Holbourne, Eſq;

The Rev. Robert Lowth, D. D. appointed Chaplain to his Excellency the Lord Lieutenant of Ireland.

The Rev. Mr. Richard Dayrell preſented with the Degree of Doctor of Divinity by the Archbiſhop of Canterbury.

The Rev. Mr. Edmund Plumpton, to the Rectory of Everingham in Yorkſhire.

The Rev. Mr. John Neale, to the Rectory of Tollerton in Nottinghamſhire.

The Rev. Mr. Tudor, appointed Chaplain to his Majeſty's Ship the Eagle.

The Rev. Mr. Fox to the Living of Uffculme, in the County of Devon.

The Rev. Sampſon Jordan, B. A. to the Rectory of Lodham in Surry.

The Rev. Mr. Henry Skey, appointed one of the domeſtic Chaplains to the Earl of Berkley.

The Rev. Mr. Charles Dickenſon, to the Rectory of Withcott, together with the Donative of Ouſton, in the County of Leiceſter.

The Rev. Mr. Benjamin Venn, to the Rectory of St. Peter in the Vale, Wiltſhire.

The Rev. Mr. James Slater, appointed Morning Preacher of St. James's Clerkenwell.

The Rev. Mr. Knock, to the Curacy of St. Clement's, Eaſt-cheap.

The Rev. Mr. Valentine Lumley, to the Rectory of Bradfield in Norfolk.

The Rev. Mr. Owen Jones to the Vicarage of Cornway in Carnarvonſhire.

The Rev. William Pinkey, M. A. one of Minor Canons of St. Paul's to the Vicarage of Charing in Kent, worth upwards of 150l. per Ann.

The Rev. William Trevor, M. A. to the Vicarage of Barrow, in Lincolnſhire.

The Rev. Mr. Green choſen Lecturer of St. John's at Wapping.

The Rev. Mr. Thomas Batman to the Rectory of Thelnetham in Suffolk.

The Rev. George Stockwell, M. A. appointed one of the Domeſtic Chaplains of the Earl of Radnor.

The Rev. Mr. Marſh, to the Rectory of Calmington in Shropſhire.

The Rev. Mr. Charles Tarrant, preſented to the Sub-deanery of Saliſbury.

The Rev. Mr. Seward, Canon of Litchfield, inſtalled into the Prebend of Lyme-Regis, in that Cathedral.

The Rev. Jonathan Barron, M. A. to the Rectory of Megaviſſy, in the County of Cornwall.

The Rev. Mr. Richard Long, B. A. to the Vicarage of Langley, in the County of Hants.

The Rev. James Bird, M. A. appointed one of the Domeſtic Chaplains of the Earl of Aſhburnham.

The Rev. John Nicholls, L. L. B. to the Rectory of Culmington, in the County of Salop, worth 180l. per Annum.

The Rev. Mr. Humphrey Chriſtian to the Rectory of Palgrave in the County of Suffolk.

Diſpenſations to hold two Livings.

The Rev. Thomas Key, M. A. Rector of Wickham, otherwiſe Wickham Bruis, in the County of Kent, to hold, with the ſaid Rectory, the Vicarage of Eaſt-church in the Iſle of Shepey, worth upwards of 200l. per An.

May 29. The Rev. William Murden, B.D. Chaplain to Lord Onſlow, to hold the Rectory of Merrow in the County of Surry; and alſo the Vicarage of Shalford, with Bramly annexed, worth upwards of 250l. per An.

The Rev. William Taſwell, M. A. Chaplain to the Rt. Rev. John Lord Bp. of Briſtol, to hold the Vicarage of Wotton-Under-Edge, in the County of Glouceſter; together with the Vicarage of Almondſbury in the ſaid County, worth 280l. per An.

June 9. The Rev. Samuel Speed, M. A. Chaplain to the Earl of Dartmouth, to the Rectory of Worthy-Martyr in the County of Southampton; together with the Rectory of Ludſheſſe, otherwiſe Lichfield, in the ſame County.

The Rev. Clement Elſwood, M. A. Chaplain to the Earl of Oxford, to the Rectory of Ibberton, in the County of Dorſet; and alſo to the Rectory of Corton-Denham, in the County of Somerſet.

The Rev. Richard Wright, M. A. Chaplain to the Earl of Berkley, to the Rectory of Bellow, with Alley united thereto, in Lincolnſhire; and alſo to the Rectory of Tointon St. Peter, in the ſame County.

B——KR——TS.

May 27. *Thomas Hobbs, of Briſtol, Currier.*
Edward Seabrooke, of Lincolnſh. Woolſtapler.
William Shallcroſs, of Southwark, Tobacconiſt.
31. *Joſ. Chapman, of London, Woollen-draper.*
Iſaac Dupree, of Spittlefields, Silk-weaver.
Thomas Long, of Kent, Innholder.
Edward Bertles, of Southwark, Cheeſemonger.
June 3. *Jaſpar Bezer, of Southwark, Vintner.*
Peter Joyce, of London, Merchant.
John Thorp, of Briſtol, Hoſier.
7. *Joſeph James, of Briſtol, Haberdaſher.*
Will. Richardſon, of Devonſhire, Lime-burner.
Peter Duncan, and John Duncan, of Birmingham, Chapmen.
Thomas Leverſuch, of Fareham, Stone-Maſon.
George Mannell, of Shadwell, Linnen draper.
10. *William Dutchman, of Scarborough, Bricklayer.*
Robert Bromley, of Cheſter, Cheeſe-factor.
14. *George Wray, of Shoreditch, Diſtiller.*
17. *John Upton, of Lancaſhire, Whitſter.*
John Faulcon, of Surry, Shopkeeper.
21. *John Webb, of Dunſtable, Grocer.*
John Topham, of London, Worſted-ſeller.
Nathaniel Ledyard, of Shoreditch, Handkerchief-Printer.
William Gayner, of Briſtol, Grocer.

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Dr. Hutcheſon's Syſtem of Moral Philoſophy, in three Books, 2 Vol. 4to. Glaſcow, printed and ſold by *R.* and *A. Foulis.* 4to. Price 1l. 1s. ſew'd. — The Author's Merit from his Ideas of Beauty and Virtue, and his Eſſay on the Paſſions, cannot but be well known to the Public. His Deſign in the above Work (in the Words of the Preface to it) is firſt, to unfold the ſeveral Principles of the Human Mind, as united in a Moral Conſtitution; and from thence to point out the Origin of our Ideas of Moral Good and Evil, and of our Senſe of Duty, or Moral Obligation; and then to enquire what muſt be the ſupreme Happineſs to a Species conſtituted as Mankind are: And then he proceeds to deduce the particular Laws of Nature, or Rules neceſſary to be obſerved for promoting the general Good in our common Intercourſes with one another, as Members of Society.

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BILL *of Mortality from* May 20. *to June* 17.

Buried		
Males	811	1639
Females	828	
Under 2 years old	553	
Between 2 and 5	172	
5 and 10 ——	44	
10 and 20 ——	49	
20 and 30 ——	127	
30 and 40 ——	153	
40 and 50 ——	187	
50 and 60 ——	150	
60 and 70 ——	103	
70 and 80 ——	66	
80 and 90 ——	29	
90 and 100 ——	6	
100 and 109 ——	0	
	1639	

Chriſtened		
Males	578	1154
Females	576	
Buried,		
Within the walls		113
Without		368
Mid. and *Surry*		772
City & Sub. *Weſt.*		386
		1639
Weekly *May*	27.	392
June	3.	414
	10.	430
	17.	403
		1639

Obſervat. on the Weather, at Temple Bar.

May	Barometer.	Therm.	Pluviameter.	Hygrometer.
23	30 : 2	29$\frac{1}{4}$	0 : 0	24 Dry.
24	30 : 1$\frac{3}{4}$	28	0 : 0	7 Moiſt.
25	30 : 1$\frac{1}{4}$	27	0 : 0	9 D.
26	30 : 1	28	0 : 0	10 M.
27	30 : 0	29$\frac{1}{4}$	0 : 2	11
28	30 : 0$\frac{1}{2}$	28$\frac{1}{2}$	0 : 0	10 D.
29	30 : 1	27	0 : 0	14
30	29 : 8	29	0 : 0	28
31	29 : 6	29$\frac{1}{2}$	0 : 0	10
June 1	29 : 8	30	0 : 2	5 M.
2	30 : 0	30$\frac{1}{2}$	0 : 0	10 D.
3	30 : 1	31$\frac{3}{4}$	0 : 0	14
4	30 : 0	31$\frac{3}{4}$	0 : 0	20
5	29 : 8$\frac{1}{2}$	32	0 : 1	27 M.
6	29 : 9	31$\frac{3}{4}$	3 : 7	18
7	29 : 9$\frac{1}{4}$	32	0 : 4	12
8	29 : 9	31	0 : 0	4 D.
9	29 : 8$\frac{1}{2}$	30$\frac{1}{2}$	3 : 4	30 M.
10	29 : 8$\frac{3}{4}$	30$\frac{1}{4}$	0 : 0	34
11	29 : 9$\frac{3}{4}$	28	23 : 6	47
12	29 : 9$\frac{1}{2}$	30	0 : 4	48
13	29 : 8	30	5 : 9	49
14	29 : 8	32$\frac{1}{2}$	5 : 2	47
15	29 : 9	31$\frac{1}{2}$	18 : 1	46
16	29 : 9$\frac{1}{2}$	31$\frac{1}{2}$	0 : 0	38
17	30 : 1	31$\frac{1}{2}$	0 : 1	35
18	30 : 1	31	2 : 5	40
19	30 : 0	34	0 : 0	34
20	29 : 9$\frac{1}{4}$	34	0 : 0	6 D.
21	30 : 0	33	0 : 0	5 M.
22	29 : 8$\frac{1}{2}$	33	0 : 0	19
23	29 : 7	31	6 : 8	11

EACH DAY's *Price of* STOCKS, *in* JUNE 1755.

☞ Books ſhut, is ſignified thus, ———

Days	BANK Stock.	E.-India	South Sea	S. Sea old An. 1ſt Su	S. Sea old A. 2d Sub.	S. Sea An. new 1ſt S.	S. Sea An. 2d Subſc.	3½ Ba. An 1ſt Subſc.	3½ Ba. An 2d Subſc.	3½ *per* C. India An.	3 *per* Cent India An.	Ba. 3 *per* Cents.	3 *per* Cent An. 1751.	India Bon præm.	B. Cir. *per* *l. s. d.*	Wind at *Deal.*	Days
24	No Price.	173¾	No Price.	97⅞	97¾	100	98¼	98¼a⅜	97⅞	97	96¾	No Price.	No Price.	45s	2 5 0	N N E	24
25	Sunday															N E	25
26	No Price.	No Price.	110½	99¾	97¾	Do	98⅞	98⅜	Do	96¾a97¼	96¾a⅞	99½	99a⅛	44s a 45	2 5 0	Do	26
27	126¼a127	174a175¼	No Price.	99⅞a100	No Price.	100	No Price.	98⅝	97¾	97¼	97	99¾	99¼	46s	2 7 6	S S E	27
28	No Price.	No Price.	111	99⅞	98	Do	99	98⅞	97⅞	Do	Do	99⅝	99⅛	27s a 8	Do	N W	28
29	127⅜	Do	No Price.	100	No Price.	100¼	No Price.	99¼a⅜	98¼	Do	Do	99¾	99¼	49s a 52	No Price.	N E b E	29
30	No Price.	175	111½	100¼	Do	Do	Do	Do	Do	97½a¾	97¾	99⅞a100	99½	52s a 56	2 10 0	S S E	30
31	Do	No Price.	No Price.	Do	98⅜a⅛	Do	98⅛	98⅞a99	98⅛	97¼a⅛	97½a⅝	No Price.	No Price.	59s a 60	2 12 6	E N E	31
1	Sunday															S b E	1
2	No Price.	No Price.	No Price.	100¼	98⅜a⅛	100¼	99⅛	99a⅛	98⅛a98	97⅝	98⅜	99¾a⅞	99⅜	50s	2 12 6	N E	2
3	127¼	175	111½	Do	98⅛	100⅜	Do	99⅛	98⅛a¼	97½a⅝	97½	Do	Do	61s	2 15 0	N b E	3
4	Do	175a174¾	111	100⅜a½	Do	Do	Do	Do	Do	Do	Do	98⅝	99⅛	57s	Do	E N E	4
5	127	No Price.	No Price.	100½a⅜	98¼	100⅜a½	99¼	99a⅛	98⅛	97⅝	Do	99⅜a½	Do	58s	No Price.	S E	5
6	Do	Do	111	100⅛a½	98½	100⅜	Do	Do	98a⅛	97⅜a½	97⅜	99½a⅝	Do	57s a 55	2 15 0	S W	6
7	No Price.	Do	Do	100⅛a¼	98⅛a¼	Do	98⅛	Do	Do	97⅜	97⅛	99⅝	Do	55s	Do	S E	7
8	Sunday															S W	8
9	No Price.	No Price.	111	100⅛a¼	98⅛a¼	100⅜	99¼	99a⅛	98a⅛	97¼	97	99⅝a¼	99a⅛	54s	2 15 0	Do	9
10	126¾	174½	No Price.	100	No Price.	100¼a⅜	No Price.	99a98⅞	98	97a⅛	96⅞a97	99½a⅛	99	53s	Do	S S E	10
11	126½	No Price.	Do	99⅞a¾	98⅛	100¼a½	99	98⅞a¾	97¾	96⅞	96¾	99	98½	37s a 32	Do	E b N	11
12	126½a¾	174¾	Do	99¾	98	100⅛a¼	Do	99	98⅛a¼	97	Do	99⅛a¼	99	53s a 54	Do	N E	12
13	126¾	174⅞	111	99⅝a¾	No Price.	Do	No Price.	99a⅛	98a⅛	96⅞a97	96⅞a97	99⅛	Do	Do	Do	N b E	13
14	No Price.	No Price.	No Price.	99¾a⅞	98	100¼	99	99	98⅛a¼	Do	96⅞	99¼	Do	54s a 55	2 17 6	E b N	14
15	Sunday															S W	15
16	No Price.	No Price.	No Price.	99⅝a¾	98a⅛	100¼	99	99a⅛	98⅛	96⅞	96¾	99⅛a¼	99a⅛	54s a 55	2 17 6	Do	16
17	127a¼	175	111⅛	99⅞a100	No Price.	100⅜	No Price.	98⅞a99	98a⅛	96⅞a97	96¾a⅞	99½a⅝	99⅛a¼	55s	Do	Do	17
18	No Price.	174⅜	No Price.	Do	98⅛	100¼a½	99⅛	99a⅛	Do	97	Do	99⅝a¾	99¼	55s	Do	S E	18
19	Do	No Price.	Do	Do	No Price.	100½a⅜	———	98⅞a99	Do	Do	96¾	99½a⅝	99a⅛	55s a 53	Do	S W	19
20	Do	Do	111	99⅞a¾	Do	———	———	99a⅛	Do.	97a96⅞	Do	Do	Do	55s	3 0 0	N E	20
21	Do	———	No Price.	99⅞	98a⅛	———	———	98⅞	98	96⅞a97	Do	Do	Do	55s	Do	N E	21
22	Sunday																22

Lottery Tickets Mark-Lane. | Baſingſtoke | Reading | Farnham | Henley. | Guildford. | Warminſter. | Devizes. | Glouceſter.

Miſcellaneous Correſpondence, For *JULY*, 1755.

A clear and ſuccinct Account of NORTH AMERICA, Hiſtorical, Geographical, &c. *continued from Page* 71.

RIGHT is ſometimes given by *power*, ſometimes co-operative with, and ſometimes ſupported by it. It is uſually attained by birth, purchaſe, or conqueſt. That by birth is natural, by purchaſe fair, and by conqueſt violent. Our acquiſitions in *America* have been generally of the ſecond kind, perhaps ſome part of the latter. But whether all, or either of theſe, matters little to conteſting EUROPEANS. As much as is neceſſary has been previouſly ſhewn, to evince our property; we are next to conſider how far we are able to ſupport it, by a fair compariſon between the *French* power and our own. This is the more pertinent, as a wild notion, has gained credit, that the *French* propoſe to take all our *Colonies*, and drive the people into the ſea: this thought has its exiſtence in the brains of ſuch who are apt to deal in the *marvellous*, or to raiſe paſſions that contribute but little to the peace, happineſs, and welfare of the ſtate.

From the moſt exact and lateſt account, we do not find that the total amount of the *French* inhabitants in *Canada* exceeds *forty five thouſand*; and how more than one fourth of them can be ſuppoſed fighting men; or, how more than one fourth of ſuch fighting men can be ſpared for diſtant ſervice, I fancy will not be readily apprehended. The ſum then of thoſe who are to drive the *Engliſh* into the ſea, are about *three thouſand*; the *Indians* may poſſibly engage *one thouſand* more, and ſuch regular troops as the *French* may tranſport thither are to compleat the amount of their army.

What theſe latter may riſe to is only material, if we neither ſend any troops, nor regiment and diſcipline any of the natives; but as neither ſeems to be the caſe, we are propably in that particular as well prepared as the *French*, but infinitely ſuperior in point of natural ſtrength in numbers, and, for reaſons hereafter, much more likely to increaſe in proportion.

For, except *Canada*, the ſtrength of *France* is very inconſiderable in *America*; it not appearing that, in all their ſettlements on the *Miſſiſippi*, they have above *ſix* or *ſeven thouſand* inhabitants, and theſe at ſeveral hundred leagues diſtance, and what could be ſpared of theſe very difficult to joyn with the other; on the contrary, our ſettlements lie ſo connected, as whatever power we have, or can conveniently ſpare for the war, are eaſily brought together; and of what that power conſiſts I ſhall now treat.

In *Nova Scotia*, beſides the Military, the *Engliſh* inhabitants are found to be about — —	5000
New Hampſhire — —	30000
Maſſachuſets — —	200000
Rhode Iſland, &c. — —	35000
Connecticut — —	80000
New York — — —	90000
New Jerſey — —	50000
Penſilvania — — —	250000
Maryland — —	85000
Virginia — — —	90000
North Carolina — —	35000
South Carolina — —	30000
Georgia — —	6000
	986000

The above account is not a vague calculation, but is taken from ſuch cenſus, numerations, and muſter-rolls, as are undoubted; but as the ſame have been taken at different times, and none within ſeven years paſt, there is a ſuitable allowance made for the increaſe, and for which in the above account is made various deductions, ſo that it is *ſeventy thouſand* leſs than what are eſteem'd the beſt computations. For, as by this I only propoſed to ſhew the folly of that prevailing notion of the FRENCH driving us into the ſea, I conceived that the leſſening of our numbers could not make the notion leſs ridiculous, as the exceſs is yet ſo great. And all that can be concluded from it in favour of *France* is, that *one Frenchman* is better than *twenty Engliſhmen.*

As to the *Indian auxiliaries*, as the reſpect either ſide, I do not any where find ſuch an account, as may give full ſatisfaction to an inquiſitive mind; but it ſeems reaſonable to believe, that the *Indians* in friendſhip with us are at leaſt upon a ballance with thoſe in alliance with the *French*, as we find that even one body of them, only, have been able, at times, to make their ſtrongeſt ſettlements tremble. Theſe are the *Six Nations*, and by much the ſtrongeſt of our allies bordering on the northern colonies: they were ſaid, formerly, to have conſiſted of *twelve thouſand* fighting men, but are now reduced to about *two thouſand*; however, that is more than ever the *French* were known to bring together, and they are on all hands allowed to be the braveſt people in *America*.

On the borders of *Penſilvania* we find about *ſeven hundred*, and we do not hear of more than that number in both *Maryland* and *Virginia*; but, farther South, are the following, the KUTAWBAHS *three hundred*, CHEROKEES *three* or *four thouſand*, the CHIKESAWS *three hundred*, and the CREEKS *one thouſand*; in the whole about *ſeven* or *eight thouſand*, bordering on the different parts of our inland frontiers, and who contribute eſſentially to their protection, and it is thought would be of more eminent ſervice were they managed with ſkill. Hence it appears, that we do not want means of defence, or indeed of offence; which however ſhall be farther illuſtrated by the following comparative ſummary, whereby is propoſed to deliver all that is farther neceſſary to be known in reſpect to *America*.

HUDSON'S BAY, the moſt northern ſettlements of the *Engliſh*, is, by the inveſtments of a *charter*, dated 2d *May* 1670, extended between 50° 30'; and 64° 00' north *latitude*, and between 55 and 90° of *longitude*; but the limits adjuſted by the treaty of *Utrecht* are beſt ſeen by *inſpection* of the *map*, noted therein, and marked off by a prickt line, and carried about 40 minutes to the ſouthward in latitude, and about ſeven degrees of longitude more weſtward than the bounds of the *charter*.

The ENGLISH have not within theſe limits any *towns*, *colonies*, or *ſettlements* of *families*, but only *forts*, and within them *ſtore-houſes* for carrying on *trade* with the *Indians*; for WOMEN are prohibited here by the company; ſo that the ſtrength of the *Engliſh* on this ſide conſiſts entirely in the reſpective *forts* of no great conſideration, and the number of reſidents the company ſend here and employ in trade. What therefore is neceſſary to be known of this country is, the ſituation of their *forts*, and the nature and advantage of their traffic.

The *northermoſt* of theſe *forts* is at *Churchill*, in the latitude of 59. The river is navigable up about 150 leagues, and then paſſing the Falls, conſiderably farther: this place has an improving trade, the track of the *Indians* thither being entirely out of the rout; and to the northward of this, not any BEVER, but there are *Marti* mine, &c. All the *forts* are ſeated on for the convenience of the *Indians* down to them on *rafts*, or in *canoes*.

The next is called *York fort*, ſeate *iſland* in about the latitude of 66° 3 out-falls of *Nelſon*'s and *Hay*'s *river*. country about this *fort* is very low ar ſhy, and pretty well repleniſh'd with tho' the trees are but of ſmall grow value of the traffic here may be in ſom ſure gueſſed at, if the report be true, bout *one thouſand Indians* come down ver to the *fort* in canoes, and brin them the following commodities: and wild-geeſe feathers, white *fox* an *tin* Zemblin ſkins, fairer than thoſe of ſquirel, cat, ermin, bever, elk, ſtag ar ſkins; thoſe *Indians* nearer the coaſt k the oil of which is clearer and bett nut-oil, and bring it to the factory.

The *Company*'s factories are all on the ſouth and weſt ſide of the Bay, except that at *Rupert*'s river, which is on the S. eaſt. *Albany* is in about the latitude of 52, and the country about is well wooded, watered, and capable of producing various kind of grain, roots, &c.

Rupert river *factory* is in about the latitude of 51, and being the ſouthermoſt, is conſequently beſt ſupplied with roots, herbage, &c. At *Albany* and *Rupert*, beſides ſome of the commodities mentioned above, the *Indians* trade with them for train-oil and whale fin; ſo that, conſidering all things together, it ſhould ſeem that our *fur-trade* on this ſide, with the feathers, ſkins, oils and fins, is on a parity with *New France*, and ſtill leſs likely to be interrupted; but is not like that in any reſpect calculated for improving of numbers; nor indeed can one eaſily perceive how they ſhould live here, in a climate, tho' equal in latitude to different parts of *Great Britain*, yet is the weather ſeverer much in the moſt *ſouthern* parts of *Hudſon*'s *Bay*, than in the moſt *northern* of GREAT BRITAIN, and much more ſteril and barren.

There are not on this *continent* any other *European* ſettlements between theſe and thoſe of the *French* in *Canada*; and it is therefore of that country we are next to ſpeak.

Canada, or *New France*, being at preſent on the footing of conteſted bounds, I ſhall not limit it by a general geography, but only regard its populouſneſs, power, and trade.

The towns and ſettlements of any conſequence in this country are ſeated on the great river St. *Laurence*, and *Quebec* is eſteemed the capital; the mouth of the river is in about the latitude of 49, and *Quebec* in about 47°

50': It is ſeated on the north ſide, about ſix hundred miles ſouth-weſt of the river's mouth, including the windings: it conſiſts of two towns, the upper and the lower, both regularly fortified, and commanded by a fort, conſtructed on an adjacent eminence; and both towns together are about three miles in circumference: it is a *biſhopric*, and here reſides the *captain-general* of all *Canada* and *Louiſiana*; its inhabitants are variouſly computed from 10 to 15000, and the uſual garriſon about 500 men.

Trois Rivières is higher up the river, about a degree of latitude to the ſouthward of *Quebec*, and about the midway between that and *Montreal*: it has its name from being ſeated on the confluence of *three rivers*, like our *Carliſle*; one of the rivers is called St. *Laurence*, the others I do not find any name for. This town is ſmall and ſlightly fortified, containing only 3 or 400 families; but is well built, and a conſiderable *mart* for the interchange of *Indian* and *European* commodities.

Montreal is about 70 miles higher up the river, and is about a degree and a half to the ſouthward of *Quebec*; it is ſeated on an iſland, about *fourteen* leagues in length, and *five* in breadth, replete with well cultivated plantations, and the town ſufficiently well fortified againſt any thing but a regular ſiege: it is ſuppos'd now to contain about two thirds the number of inhabitants as QUEBEC; but then it follows, that either *Quebec* is over computed, or that *Montreal* is vaſtly improved ſince 1688, when the *Iroquois*, in open day, and not by ſurpriſe, entered this iſland and burnt and deſtroy'd all the plantations round the town, without meeting with any material reſiſtance.

Theſe are all the *towns* of any kind of note that the *French* poſſeſs in this part of *America*; for of *New Orleans* I ſhall ſpeak in its proper place; and I can not find their villages are many and populous; ſo that the computation of 45000 *French* in this country is an ample allowance, and moſt probably too many.

Above *Montreal* the river St. *Laurence* is not navigable, owing to various *cataracts*, or *water-falls*, and in conſequence very ſwift ſtreams. The whole courſe of the navigation downwards is very dangerous and difficult, being full of rocks, iſlands, and ſhoals, and ſubject to thick fogs, and when clear of them to tempeſtuous weather; all of which are very great obſtructions to navigation in ſo narrow a channel, eſpecially for ſhips of any force or magnitude.

Beſides, the climate is ſo cold, that the river is uſually frozen up from *October* to *May*, and the earth is ſo long covered with the ſnow, that the inhabitants find it very difficult to maintain any conſiderable number of cattle through the winter.

The *Indian* trade is the main buſineſs of this country, and takes off ſo many of their labourers, that they often fall ſhort of grain for their annual ſubſiſtence.

The FRENCH, being naturally *ſlaves*, eaſily become *ſavages*, marry, and live amongſt them, as freer than their domeſtic ſtate; but this, however it takes off from agriculture, tends conſiderably to the improvement of their trade. Theſe fellows are called *coureurs de bois*, and live on a parity with the *wild Indians*. They do not by this forget their country, but taſting the benefit of a better acquiſition than they could make by labour at home, are very adroit in managing the *Indian* traffic at once to their own advantage, and to that of their country.

To ſupport theſe and the *Indians* in alliance, and to cut off as much as poſſible a trade with our colonies, they have conſtructed various *forts*, that make a kind of chain from *Montreal* to *New Orleans*.

A little below *Montreal*, where the *Iroquois* river enters St. *Laurence*'s, is *fort Sorel*, and the midway between that and *lake Champlain* is *fort Chambli*, and about 100 miles north by eaſt of *Crown-point*. On lake *Ontario*, about 60 miles north of ours, at *Orweys*, is *fort Frontiniac*; one other they call *Denonville* at *Niaguara*, and another on the *canal of communication* between the *Huron*'s and *Erry lake*, beſides thoſe capital *forts* at *Crown-point* and on the *Ohio*, and a great number of *ſtockados* to compleat the chain.

In the principal of theſe, as in the towns, garriſons are maintained at the king's expence, which at once adds ſtrength to the colonies, and circulates a good deal of running caſh, which gives vigour and ſpirit to their trade. But after all, there ſeems more of whim than probability of ſucceſs in compleating this national chain, that wants ſeveral millions of people to make it appear of any other conſequence than ſometimes interrupting our interchange of commerce with the diſtant *Indians*; and it ſeems almoſt as ridiculous, that the *Engliſh*, having ſuch a vaſt ſuperiority, ſhould ſuffer this chain to have any links ſubſiſting, upon which I do not chuſe at preſent to make a very natural reflection.

The diſtance between QUEBEC and *New Orleans* is at leaſt 700 leagues, the way they are oblig'd to travel; it is a journey by the lakes of three months from *Canada*, and three times as much back, the ſtream being againſt them; and the diſtance by ſea, if that was any thing to the purpoſe, near a thouſand leagues. How weak and ill ſupported then muſt this chain be, and in conſequence, how eaſily broke and deſtroyed by very moderate numbers! It therefore ſeems to me better to deſtroy theſe than build any our ſelves, as numbers cannot want *forts*; tho', where numbers are not, *forts* may be requiſite; however, it ſeems to me, that if we cannot beat them out of their forts, there is no reaſon to expect that we ſhall be able to maintain any we may build.

Acadia, or *Nova Scotia* is bounded on the north by the gulph and river of St. *Laurence*, on the eaſt partly by the ſaid gulph, which divides it from *Newfoundland*, and partly by the *Atlantic* ocean; on the ſouth by the great opening of the *Bay* of *Fundy*, and on the weſt by part of the ſaid *Bay*, and by a *continent* of unknown weſtern extent, and is from north to ſouth, from the entrance of the river St. *Laurence* in the latitude of 50, to *cape Sable* in the lat. 43, eight degrees, or 552 miles of 69 to a degree. The principal ſettlements in this country are *Anabolis royal* and *Hallifax*, and the *Engliſh* inhabitants are now computed at 5 or 6000, the *French* ſubjects of the *crown* of *England* at about 15000, but not to be depended upon, in reſpect to our valuation of the ſtrength of the country. *Anapolis* is a tolerable fortification, ſeated on the upper part of a fine harbour in the *Bay* of *Fundy*, and in about the lat. of 44; and is the only harbour of note on the weſt ſide. On the eaſt and S. eaſt are many fine harbours, but principally that of *Chebucto*, within which is the *town* of *Hallifax*; this is the only regular plan'd town in the *Britiſh* dominions, except *Philadelphia*, and the reaſon of both is, that they were built on a form'd plan; this has four ſtreets each way on the ſquare, croſſing each other at right angles; the houſes are tolerably built, and the number of inhabitants, including the garriſon, about 4500. It is fortify'd by a ſingle line and five regular baſtions, and the harbour is one of the fineſt in the world. Over the *Iſthmus* a communication is gradually forming between this town and *Anapolis Royal*, which, when compleated, will cover a large extent of country to the ſouthward. *Hallifax* is finely ſituated for commanding the eaſt coaſt fiſhery, formerly carried on from *Cauſeaux*. The *ſhip-timber* here is of quicker growth than in *Canada*, and in great plenty; and altho', conſidering the latitude, the winters are very ſevere, yet is the ſoil capable of producing moſt of the grains, roots and herbage, common to *Great Britain*: and as the people increaſe and flouriſh, a trade will naturally enſue, and thence encouraging more people to come over, this ſettlement may in a moderate courſe of time be alone a match for *Canada* on this ſide, as *New England* is on the other; it being reaſonable to think, that this *colony* will grow faſter than *Canada*, as being a much better climate.

I ſhall for the preſent paſs by the reſpective iſlands of *Cape Breton*, *Newfoundland*, &c. as not material to the point in view, and as breaking into the connection of our power and intereſt on the *continent*.

New England, generally ſo called, and the next in order, is divided into four provinces, the *Maſſachuſets*, *Hampſhire*, *Connecticut* and *Rhode iſland*: Taking the four provinces together, they are ſeated between the lat. 41 and 45, and 67 and 73 *weſt* longitude, bounded on the *N. weſt* by *Canada*, on the *N. eaſt* by the *Bay* of *Fundy* and *Nova Scotia*, on the *eaſt* and *ſouth* by the *Atlantic* ocean, and on the *weſt* by *New York*, extending in length about 300 miles, and in breadth in ſome parts about 200 miles.

The whole province of *New Hampſhire*, included in one county, is to the northward of the *Maſſachuſets*, but has the *province* of *Main*, part of the *Maſſachuſets*, between it and *Nova Scotia*. It is, as I take it, within the boundaries of this province that the *fort* ſo much talk'd of, at *Crown-point*, is conſtructed by the *French*, as you ſee it in the map. on the point of *lake Champlain*, which ſeems to receive its waters from the river St. *Laurence*, by a ſtream from *Trois Rivières* extending thereto, but on the contrary, is one of the ſtreams that feeds St. *Laurence*, and has its ſource in that *lake*, in the opening between which and the higher ſtream of St. *Laurence*, and ſo down to the *lake Errie* on the back of *New England*, *New York*, and *Penſilvania*, is the country of the *Iroquois*.

In 1742, an account was taken, and the whole inhabitants of this province found to be twenty-ſix thouſand, and computed by the increaſe ſince to be now about 30000.

The *Maſſachuſets* are divided into eleven counties, and thoſe again into one hundred fifty-three *townſhips*; theſe *townſhips* are not known by a contiguity of houſes, but by a meaſure of four, five, or ſix miles ſquare, wherein the inhabitants are pretty much ſcattered: BOSTON, the capital, is, however, a large, compact and well built town; it contained in 1742, 1719 *dwelling houſes*, 166 *warehouſes*, 16382 *white people*, and 1514 *Negroes*; and in the whole colony, about 200000 ſouls.

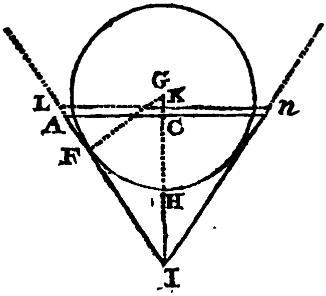
Rhode iſland, including *Providence* plantations, is divided into four counties, which comprize 24 townſhips. By an exact account taken in 1748, there were in this colony 28439 *Whites*, 3077 *Negroes*, and 1257 *Indians*, and the increaſe ſince may be to the amount of 35000, the utmoſt that can well be ſuppoſed.

[*To be concluded in our next.*]

MATHEMATICAL QUESTIONS *Anſwered.*

Having received the following Anſwers to Queſtion 9. ſince the Publication of our laſt N°. *we place them here.*

Queſtion 9, anſwered by T. J.



LET the Semidiameter of the Ball G F $= x$, the Height of the Segment immerſed K H $= y$, the Height of the Liquor by the Immerſion of the Ball $=$ KI $= d$, let AC : AI (:: 2 : 3,6055) :: $c : b$, then, *per* Sim. Δs $c : b : x : \frac{bx}{c} =$ IG, and $\frac{bx}{c} - d =$ GK, and $x + d - \frac{bx}{c} = y =$ K H, hence $x = \frac{d-y}{\frac{b}{c} - 1}$, let $z = ,7854$ and by a common Theorem $\frac{4}{3} z \times \overline{3xyy - y^3}| =$ Solidity Seg. immerſed, and for x writing its Value found, we have $\frac{4}{3} z \times \overline{\frac{3dyy - 2y^3 - \frac{b}{c}y^3}{\frac{b}{c} - 1}}| =$ Seg. Solidity; in Flux. $6dy\dot{y} - 6yy\dot{y} - \frac{3b}{c} yy\dot{y} = 0$ hence the Segment's Solidity $= \frac{4}{3} z \times \overline{\frac{4c^3bd^3 + 8c^4d^3}{\overline{b-c} \times \overline{b+2c}^3}}|$. Let C I $= 3. = n$, then $n : c :: d : \frac{cd}{n} =$ K L, hence the Contents of the Glaſs up to that Place $= \frac{4}{3} z \times \frac{ccd^3}{nn}$, and $\frac{1}{4}$ the Content of the whole Glaſs $= \frac{zccn}{3}$, then *per* Queſt. $\frac{4}{3} z \times \overline{\frac{4c^3bd^3 + 8c^4d^3}{\overline{b-c} \times \overline{b+2c}|^3} + \frac{zccn}{3}} = \frac{4}{3} z \times \overline{\frac{ccd^3}{nn}}|$ this Equation reduced $\frac{4}{nn} - \frac{16c}{\overline{b-c}| \times \overline{b+2c}|^2} \times d^3 = m$, hence $d = \overset{Inches}{3,1084} =$ K I the perpendicular Aſcent of the Liquor; (if the Sides of the Glaſs were continued high enough;) and $x = \overline{\frac{d-y}{\frac{b}{c} - 1}}| = \overset{Inches}{1,8356} =$ the Semidiameter of the Ball required.

Z. LEKSAG's *Solution.*

PUT $y =$ F G the Rad. of the Ball, $yx =$ K H the Height of the immerſed Segment, $c = 3.1416$. Then by a well known Theorem, the Solidity of the ſaid Segment will be $= \frac{bcy^3x^2 - 2cy^3x^3}{b}$ This $+ c$ (c by the Data being $=$ to the Quantity of Liquor) will be equal to the Solidity I L n. Next, by ſimilar Triangle, As $2 : 3 :: y : \frac{3y}{2} =$ F I, *per* 47 *Euc.* 1. $\sqrt{\frac{9yy}{4} + yy}| = 1.80277563y =$ G I $\therefore 0.80277563y =$ H I. Then is $.80.277563y + yx$ $(= ay + xy) =$ K I which is to be a Maximum. Again, As $3 : 2 :: ay + xy : \overline{ay + xy} \times \frac{2}{3} =$ L K. $\overline{LK}|^2 \times c \times \frac{1}{3}$ K I $= \overline{ay + xy}|^2 \times \frac{4c}{9} \times \frac{1}{3}$.

Queſtion 38.

By Mr. George Murrant.

ON the 10th of *June* 1755, in Lat. 54° 36′ N. my Cane ſtanding upright on an horizontal Plane, did caſt a Shadow 64 Inches long, but ſlipping thro' my Fingers, and falling towards the ſaid Shadow, the Shadow was 54 Inches long when the Cane made an Angle of 30° with the Horizon. Required the Hour of the Day, and Length of the Staff?

AS we ſhall make it our Buſineſs, through the Courſe of this Work, to point out all the ſingular and extraordinary Productions of Nature in the *Animal*, *Vegetable*, and *Foſſil* Kingdoms; ſo we ſhall take an Opportunity, very often, of preſenting our Readers with their proper *Icons*, or Repreſentations in Copper-Plates, that they may have a more lively Idea of the ſame. Accordingly, we have here given a microſcopical View of the moſt curious Inſect of the *Phalæna* Kind, *viz.* of the *ſmall, white plumed*, or *feather'd Moth*; which, we doubt not, will be deemed a Curioſity by others as well as ourſelves, as it is an anomalous Species, and is in itſelf of a beautiful Form, and of a Colour, the *whiteſt* in Nature: They are found in great Plenty in the Evenings in *May* and *June*, in many Parts of *England*, but particularly in *Hampſhire.* The Wings of other Moths are *membranous*; but of this, they conſiſt of fine diſtinct and moſt elegant Feathers. We have already taken Notice of it in the *Theology of Inſects*, and ſhall have Occaſion hereafter to be more particular in its Deſcription.

A Deſcription of a Machine for a *perpetual* Electrification.

AS it is our profeſs'd Deſign to improve every Diſcovery for the Public Good, as far as we are able; and as *Electricity* is now well known to be ſomewhat more than a Matter of *mere Curioſity*, inaſmuch as it has been ſucceſsfully applied to the Cure of ſeveral Diſorders of the *rheumatic* and *paralytic* Kind, and to remove Obſtructions and Pains occaſioned thereby; alſo it is well known greatly to promote *Vegetation* in *Plants*; and doubtleſs might be found of Uſe in many other Caſes, if it were applied in a *proper Manner*, I mean ſo that it might be rendered *conſtant* or *perpetual*, and not *momentary* and *inſtantaneous*, as in the *common Way* of uſing it. For, if ſuch ſurprizing Effects be producible by its ſuddain, and, as it were, ſingle Action, what may we expect from the continual Action or Influence of ſuch a powerful Agent; that is to ſay, from a *perpetual Electrification* of *animal* and *vegetable Bodies*?

In order to aſſiſt in ſuch an Undertaking, we here propoſe a Machine, which we think will be ſufficient for an Experiment of this Kind. It is the Application of the *Hydraulic Machine*, invented many Years ago, by Dr. *Barker*; with a proper *Apparatus* for perpetually electrifying the Plants and Fruit Trees of an *artificial Garden*. The Deſcription of which is as follows.

a, b, is the upright Tube or Body of the Machine, 8, 10, or 12 Feet in Height.

c, d, the horizontal Trunk, thro' which the Water ſpouts from Holes at each End, but on contrary Sides.

e, e, A large open cylindrical Part on the Top of the Machine, to receive the Water from.

f, f, A Trough, which brings a ſmall Stream of Water from ſome adjacent Spring, *&c.* which turns the Machine.

g, h, Two Glaſs Globes, turn'd by the Machine by means of a Cord from the Groove in the outer-Part of the Receiver *e, e*, and moving in Grooves of leſſer Wheels fix'd on the Axles of the Globes.

i, i, Two Screws, by which the Cuſhions are preſs'd againſt the Globes for greater or leſſer Degrees of Friction.

k, k, Two iron Arms fixed in the Frame of the Machine, and projecting beyond the Globes, ſuſpend, on ſilken Strings, a long Rod of Iron, in Form of T, whoſe Part

l, l, receiving the Electricity from the Globes, conduct it to

m, n, o, A ſlight Frame of Wood in the Front.

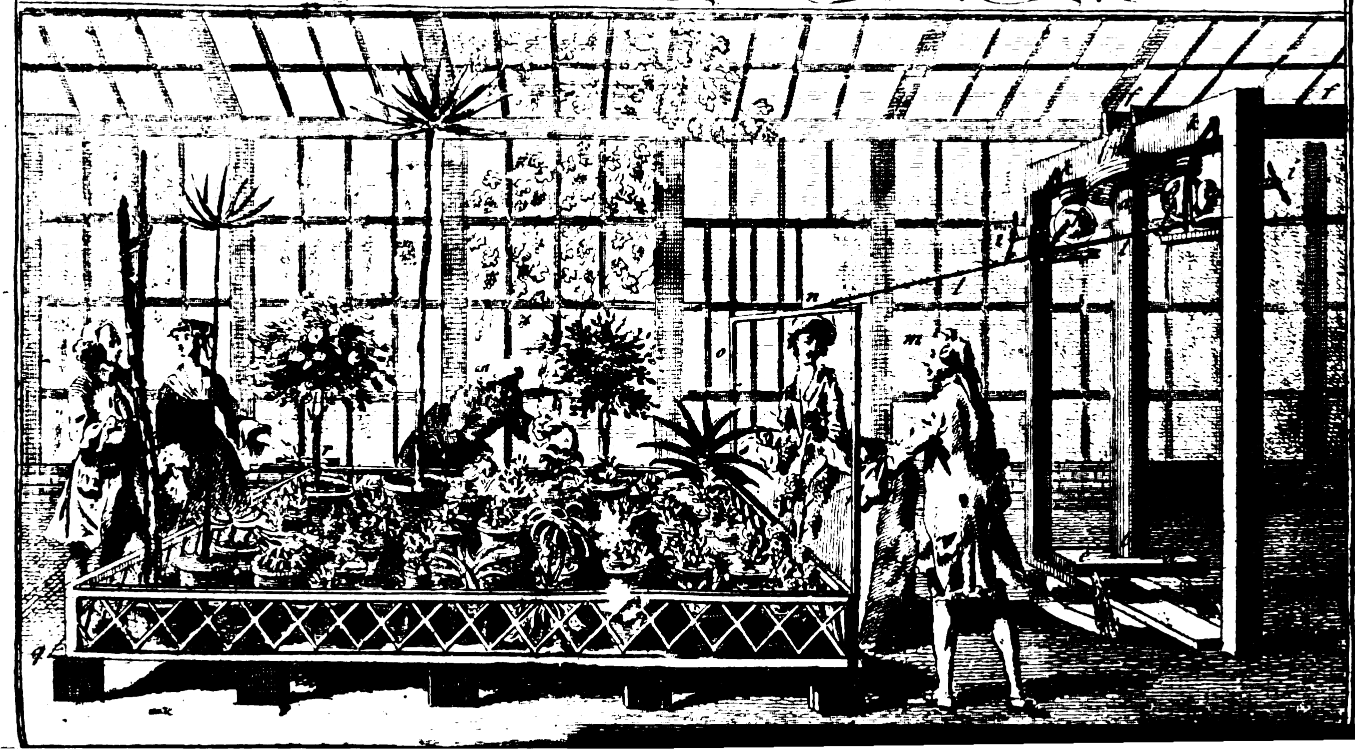
p, q, r, s, The Electrical Garden, placed on

t, t, t, t, &c. ſmall Pedeſtals, or Pillars of *Wax* and *Roſin*.

In this Garden may be placed in Pots any Sorts of Plants, Flowers, *&c.* which, when the Machine is in Motion, may be conſtantly electrify'd. One Globe is enough to be in Motion at a Time; and when that is too hot, the other may be put into Motion; and ſo they may be alternatively uſed Night and Day, without Ceſſation of the *Electrical Effluvia* on the Plants. As a conſtant Stream of Water may in moſt Places be had, and as the Expence of ſuch a Machine and Garden would not be very great, it is much to

Jonas
Kershaw

A MACHINE for a Perpetual Electrified GARDEN.



to be wiſh'd, that thoſe who have it eaſily in their Power, would oblige Mankind with ſome Attempt of this Nature, that they might be ſatisfied what could be effected in *Medicine* or *Phyſics*, by a *perpetual Electrification.*

N. B. Eight or ten Feet Fall of Water will be more than ſufficient for this Purpoſe, and the Diameter of the Tube, *a, b,* five or ſix Inches at moſt.

On the *Abſence* and *Return* of a Friend.

IF there's a joy on earth, 'tis friendſhip's flame,
Where friendſhip is inviolate and true;
To love itſelf it bears ſuperior claim,
And to it's ſhrine more ſacred truth is due.

If honeſt friendſhip ſo delights the heart,
If 'tis ſuch joy a faithful friend to gain;
Or *death*, or *abſence*, when they call to part,
Muſt torture with proportionable pain.

From *abſence*, *hope* will give the mind relief,
And reaſon teach us what we ought to bear;
But *death* in *friendſhip*, is the *life* of *grief*,
Hope then is dead, and all is deep *deſpair*.

If ſeparation gives ſuch pain,
Does ſo our peace deſtroy;
From abſence, the return again
Gives heart-exulting joy.

That joy be mine, ye muſes, hear,
The gladſome ſong inſpire,
And teach a heart that is ſincere
To ſing its ſacred fire.

Let diſcontent no longer know
The gloom of ſolitary woe;
But ſpritely wit, and mirthful ſong,
Hither come, oh! come along:
Hither come, and bring with thee,
Open-tongued *ſincerity*,
Faithful friendſhip, honeſt truth,
Jolly age, and gayſome youth;
Hither come, and join to prove
All the joys of ſocial love.

Let *pleaſure* ſpread her roſy wing,
Let *harmony*, attendant, ſing;
And let, of *truth*, the torches burn,
To celebrate a *friend*'s return.

In high-wav'd tides let tranſport roll,
And animate the drooping ſoul;
Whilſt meekneſs and benevolence,
Soft pity, and engaging ſenſe,
And every wiſh, and every joy
That never ſicken, never cloy,
To friendſhip wing their top-moſt flight,
Diffuſive as the clouds of night.

'Tis done, I feel, I feel the fire
That only *virtue* can inſpire:
This is the joy that *friendſhip* knows;
That is the *fountain* whence it flows.

A SONG.

WOU'D all the pow'rs attentive be
To hear their vot'ry's pray'r,
And grant a bleſſing unto me
To baniſh all deſpair;
In toying ſweet I'd ſpend the day,
Where artleſs ſhepherds rove,
And linnets, perch'd on ev'ry ſpray,
Invoke my *Daphne*'s love.

For love ſhou'd bear the ſov'reign ſway,
It's fire poſſeſs each breaſt,
While we in woodbine bow'rs play,
And live completely bleſt.
In pleaſure thus, the roving bee,
That ev'ry flower ſips,
Shall wanton round, and envy me
The ſweets of *Daphne*'s lips.

We'd taſte the dewy ſweets of morn,
Joy ſhould each boſom fire,
And mirth my *Daphne*'s face adorn,
And love her mind inſpire:
Whilſt Nature thus is pleas'd to ſee
The Graces all unite,
The birds ſhall chirp, on ev'ry tree,
My *Daphne* to delight.

DAMON.

YOung *Damon*, once the happieſt ſwain
That ever pip'd on verdant plain,
Or ſung a roundelay;
All jocund youth to mirth inclin'd,
The ruſtic dance he always join'd
To hail the flow'ry *May*.

'Till love had reach'd the ſhepherd's heart;
Corinna threw the fatal dart,
Then griev'd the wound ſhe made:
No more he flies to rural ſports,
Nor with the mirthful train reſorts,
He ſeeks the gloomy ſhade.

'Twas there, oppreſs'd with heavy Grief,
Ye Gods, he cry'd, or ſend relief,
Or bid th' unpity'd die!
Still muſt I live and love the maid!
Ah, cruel fate! — No more he ſaid,
But fainting heav'd a ſigh!

As oft the ſhepherd walk'd the wood,
So oft *Corinna* liſt'ning ſtood,
To hear and mock his pain:
But ne'er, 'till now, a tear o'erflow'd,
Or one kind pitying look beſtow'd,
On the unhappy ſwain.

Now, pierc'd with agony, ſhe flies,
And *Damon*, *Damon*, *Damon*, cries,
Thy tender heart I broke!
And can'ſt thou ſpeak? — Ah, no, he's dead!
Then wrings her hands — and now they're ſpread,
The whilſt theſe words ſhe ſpoke:

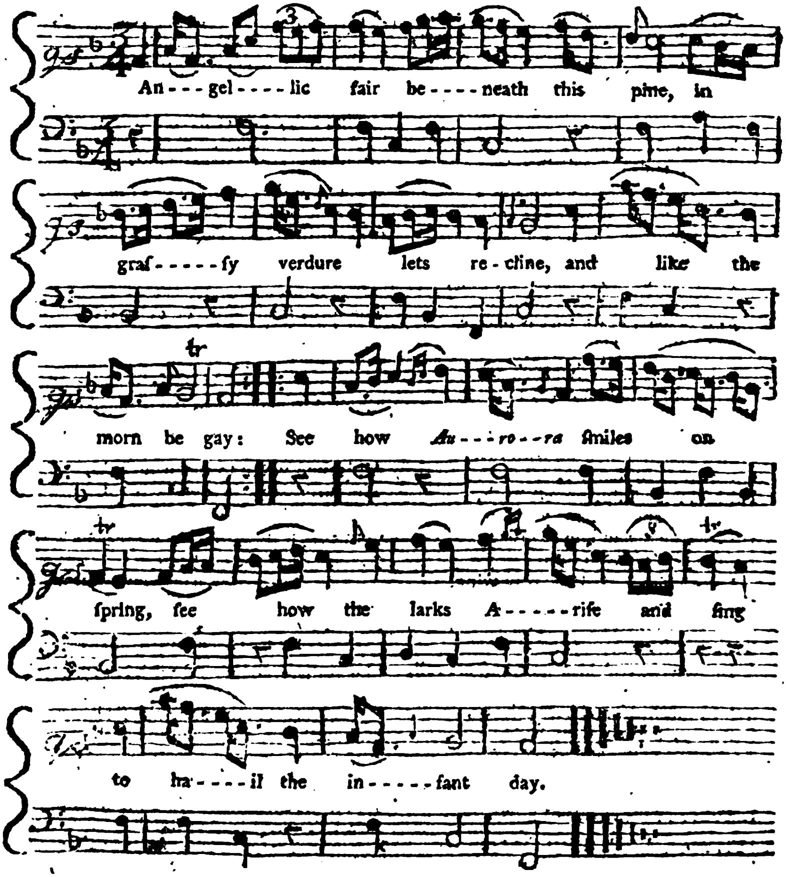
" Oh! *Damon*, tho' I once refus'd
To hear the ſofteſt words you us'd,
That might to pity move;
Had you the power to know it now,
I'd kneel and make a ſolemn vow
No other ſwain to love."

Thus ſpoke the fair, and *Damon* found
In ev'ry word a joyful ſound,
That bid his fears abate.
A while he gaz'd, then in his Arms
Receiv'd the maid, with all her charms,
And bleſs'd the change of fate.

M. P.

ANGELIC FAIR. *A* SONG.

By W. SWIFT, *of* Stow, Lincolnſhire.


An - - - gel - - - - lic fair be - - - - neath this pine, in
graſ - - - - - ſy verdure lets re - cline, and like the
morn be gay: See how *Au - - - ro - - ra* ſmiles on
ſpring, ſee how the larks A - - - - - riſe and ſing
to ha - - - - il the in - - - - - fant day.

Reſume the ſweetneſs of thy tongue,
Which has now charm'd my ear ſo long,
With Accents half divine;
My pipe ſhall ſwell its liquid ſtrain,
And ſink it's riſing Notes again,
In Uniſon with thine.

Muſic ſhall waſte the morn, the day
Will roll, unheeded (as we play)
On Wheels impell'd by love;
When weary, we will deign to reſt
Alternate on each other's breaſt.
While Cupid guards the grove.

What prince can boaſt more happineſs,
Than I, poſſeſſing thee, profeſs
All toils are baniſh'd hence?
Say, mortals, who our weeds deſpiſe,
In what ſuperior pleaſure lies,
To love and innocence?

A PETITION to PROVIDENCE.

(By a LADY.)

WOuld *Providence*, with kindneſs hear my *prayer*,
And deſtin me of *happineſs* a *ſhare*,
(Since but a *ſhare*, alaſs! was e'er deſign'd,
To bleſs on *earth* the *beſt* of *humankind*:)
Let me, as *health* muſt my *foundation* be,
Poſſeſs an eaſy ample *ſtock* of *thee*.
Next, as *ambition* never rack'd my *brain*,
(A thing that muſt by *all* be found moſt *vain*)
Let all my humble *hopes* be *juſtly bent*,
Nor let me e'er aſpire beyond *content*.
Low if my lot ſhould be, *content* will *pleaſe*,
When proſperous *affluence* is void of *eaſe*.
Strait thro' thy paths, O *virtue!* lead my *mind*,
Regardleſs of the *thorns* I there *may find*:
Sweet are the *roſes* thou ordain'ſt to *blow*,
And *thorns*, with *roſes*, muſt for ever *grow*.
Teach thy great pupil *thought*, the mighty *art*,
To *charm*, *inſtruct*, but not to *pain* the *heart*:
Say, *reaſon*, can that *contradiction* be,
When *thought* and *memory* ſo well agree?
Will not life's *woes*, and *wrongs*, diſturb the *ſcene*?
No; even *thoſe* can *virtue* make *ſerene*.
Wrap'd in *itſelf*, all foreign ills *endure*:
Or only *ſigh*, and *wiſh* for power to cure.
Nature's wide *works* ſhould dignify my *ſoul*,
And *years*, like *hours* of *happineſs*, ſhould roll;
Nor ſhould one *hour* hang heavy on my *hand*,
To be at any but a *friend*'s *command*:
If, *Providence*, thou wilt allow me *this*,
To crown the ultimate of all my *bliſs*:
Scarce to be *found*, *indeed*, and to our coſt,
But ſeldom truly *known*, 'till ever *loſt*:
Yet let me *hope* to find ſome faithful *few*,
Whoſe *converſe* ſhall the *taſte* of *life renew*.
Bleſs me with *years*, for my dear *infants ſake*,
And may *they long* of every *good* partake:
While, with a *pleaſing pain*, I daily trace
The *father's features*, in each ſmiling face!
But, if too ſhort a ſpan for *me*'s deſign'd,
O, gracious *Providence*, to them be kind!
Thy *all-ſufficient hand* can point their way,
And may their *virtue* teach 'em to *obey*.
Grant me poſſeſſion of ſome *happy cell*,
Where I, *unenvy'd*, may in *quiet* dwell!
There rural pleaſures ſhould my mind regale,
And *innocence*, in various ſhapes *prevail*.
My *books* and *pen* muſt claim the *foremoſt ſeat*:
For only *they* can make *retirement ſweet*.
Life's trifling troubles *they* can render *calm*,
And find for every *wound* ſome healing *balm*.
Nor would *I* wiſh too much for *fortune's toys*,
But they are *needful*, and would *bleſs* my *boys*.
Would bleſs *lov'd friends*, who droop in fortune's ſhade,
And bring life's proſperous *ſunſhine* to their *aid*:
For, *undeſerving* muſt that *mortal* be,
Who can *unpain'd* the *pains* of *others ſee*.
Small is the *wiſh* that might for *one* delight,
But let *me ſee*, with more *expanſive ſight*:
Taught by too *harſh* a *maſter*, *ſtern diſtreſs*,
I now can limit *hope* to *happineſs*.
They whom *experience* teaches to be *wiſe*,
Will thro' *content* the greateſt *fall deſpiſe*;
And think 'tis ſcarcely worth their *wiſh* to *riſe*.
But if, O *Providence!* thou e're ſhoud'ſt deign
To ſuffer me this humble ſuit to *gain*;
May I, of power ſo *wiſh'd*, be *diſpoſſeſt*,
Whene'er *humanity* forſakes my *breaſt*.
Firſt, and unceaſing, let me ever raiſe,
Reflection's *power*, to ſing it's *Maker*'s *praiſe*!
Studious for ever in *that fruitful field*,
Imagination ſhall *enlargement* yield:
On to the *grave*'s dark *verge* admiring ſtray,
'Till *death*'s long *night* concludes the *tireſome day*.
Propt on ſtrong *hope* and *faith*, here *thought* grows blind,
Sickens thro' *doubt*, et leaves *deſpair* behind.

On the IMMORTALITY *of the* SOUL.

IF we with brutes muſt ſhare a common fate,
Nor quit this earthly, for a better ſtate,
If cruel death deſtroys the thinking part,
And ſtrikes the ſpirit, as it ſtrikes the heart,
Say, to what purpoſe was our reaſon given,
Reaſon, the greateſt, nobleſt gift of heaven?
Say, who would ever be upon their guard
'Gainſt vice, if virtue meets with no reward?
Much happier does the libertine appear,
Who drinks of pleaſure's cup without a fear;
His days are jovial, every ſcene is gay,
And in amuſements paſs his time away,
'Till the laſt period of his life is come,
And death conducts him to the ſilent tomb.
Turn from this picture of earth's happy man
And let us that of Virtue's votaries ſcan,
See merit oft expos'd to envious hate,
The frowns of fortune, and the ſtorms of fate;

See the good man by dire miſfortune led,
Subſervient to the wealthy fool for bread;
There often doom'd to hear what gives offence
To truth, morality, and common ſenſe,
'Till worn with ſorrow, and by grief oppreſt,
The weary ſoul ſighs for its promis'd reſt,
And, like the hireling, working for his pay,
Welcomes the evening of a toilſome day:
If this be true, what greater proof can riſe,
That virtue blooms but in her native ſkies;
The charming plant here nurs'd with tender care,
By death tranſplanted, yields its produce there:
This thought alone can the good man ſuſtain,
And give him eaſe in poverty and pain.
Who will not calmly bear ſtern fortune's frown,
That knows he ſoon ſhall gain a heavenly crown?
Who does on ſublunary bliſs depend,
That hopes a happineſs which ne'er ſhall end?
Have courage then ye meritorious few,
Whom ſtrong temptations labour to ſubdue,
Fight the good fight, and with life's lateſt breath
Prove glorious victors over ſin and death.

M. Dawſon.

DELIA.

On *Delia*'s boſom — *Delia* faireſt maid
That fickle taſte e'er yet acknowledg'd fair —
Th' enamoured *Thyrſis* gently lean'd his head;
There breath'd his vows, and told his ev'ry care.

An artleſs Mind, and ev'ry manly grace,
Good ſenſe, good nature, form'd the lovely ſwain;
Sweet innocence beam'd chearful in HER face,
Her open look unſkill'd, untaught to feign.

Long had their breaſts indulg'd a fond deſire,
Youth ſtrove to hide it under friendſhip's name;
But riper age confeſs'd a warmer fire,
And love now bluſh'd at friendſhip's weaker flame.

A ſpreading elm beſtow'd its friendly ſhade;
Delightful refuge from the noontide heat!
Around their flocks a liſt'ning circle made,
Attentive to her voice — divinely ſweet.

Thus ſung the nymph: --this melody we hear,
Is ſpring, ſoft warbling in the vocal grove;
It's plumy tenants breathe their ſonnets there,
And rous'd by *Phœbus*, wake to life and love.

The morning fragrance, and cool temp'rate air,
The ev'ning murmurs of the whiſp'ring breeze,
Are nature's welcome to the vernal year,
Pledges of warmth, ſerenity and eaſe.

O'er the gay lawn the Zephyrs ſlowly creep,
And, near the grove, their wings with trembl'ing play,
Seem loth to enter, leſt a ruder ſweep
Should ſtrip the branches of their infant ſpray.

Flora begins her elegance to ſhow,
In ſweeteſt robes of innocence array'd:
Fair as the lilly, or the driv'n ſnow,
See yonder ſnow-drop hangs its lovely head.

The purple vi'let and the bramble-roſe,
Largely diffuſe their od'rous ſweets around;
Rich in its golden veſt the crocus blows,
And ſilver daiſies paint th' embroider'd ground.

Exalted *Phœbus* gilds th' extenſive plain,
And ſheds abroad his vivifying rays;
Kind ſubſtitute for winter's dreary reign!
Parent of hoary nights, & darkſome days.

Could fate be influenc'd by my way-ward will,
Or heav'n indulgent grant my frequent pray'r,
No ſummer's ſun ſhould melt, no winter chill,
But ſpring eternal conſtitute the year.

Thus *Delia*. — He with kind encircling arms
Expreſs'd his joy, nor turn'd her cheek away;
Her gentle breaſt an equal tranſport warms,
While *Thyrſis* utters this reſponſive lay.

Their notes how ſweet! yet thy ſoul-melting voice
Excells the warbling of the airy throng:
Nor think they now for ſpring's return rejoice,
'Tis *Delia*'s preſence animates their ſong.

Shrill *Philomela* tries a livelier ſtrain,
Forgetful of her woes: — yon billing doves
Perch'd on one bough, each other entertain
With cooing warmth, — fond emblem of our loves!

Where'er you tread ſoft Zephyrs round you play;
Swift to their poſts the anxious Sylphs repair,
Leſt a rude blaſt ſhould hapleſs diſarray,
The nice-ſet ringlets of thy comely hair.

The pallid ſnow-drop droops it's flow'ry leaves
When near thy fairer hand; — thy virtuous breaſt
The

The white-rob'd goddeſs, Innocence, receives:
A manſion worthy of its heavenly gueſt.

The air, replete with ſweets that *Flora* pours
From the encloſing purple tinctur'd mead,
Or fraught with odours of *Arabian* bowers,
Does not the fragrance of thy breath exceed.

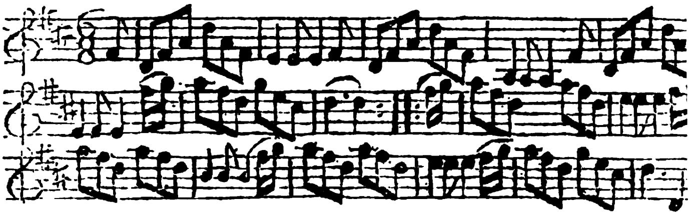
My ſoul is chear'd by thy inſpiring ſmiles,
As by the ſolar beams the teeming earth:
Thy preſence winter's tedious hours beguiles;
Refined ſource of elegance and mirth!

In thy ſoft converſe every bliſs I find
Not the cool freſhneſs of the
ſtreams
Gives more delight to the laborious
Scorch'd with the ſummer's ſun's
dent beams.

Let fate diſpenſe her gifts or cold or wa
Give *Delia*, Heav'n! ſhe'll every p
bring:
Each ſeaſon, bleſt with her, has po
charm;
In *Delia* centre all the joys of ſprin

Sa

The Press-Gang's Jigg: *Or*, A Trip to the Tender.



The Firſt and Second Men take Hands and lead thro' the Women's Side and rou
Top into their own Places. ÷ The two Women do the ſame. ÷ The firſt Coupl
thro' the ſecond Couple and caſt up into their own Place. ÷ Caſt off and lead th
third Couple, and caſt into the ſecond Couple's Place. ÷ The firſt Man turn his P
with his Right Hand and the third Woman with his Left (his Partner turn the
Man with her Left at the ſame Time) ÷ The firſt Couple turn with the Right Hand
the firſt Man the ſecond Woman, and the firſt Woman the third Man with their L
Lead thro' the ſecond Couple, caſt off and turn. ÷ Lead thro' the third Couple, caſt u
turn. ÷

☞ *As the Public have been pleaſed to ſhew ſo favourable a Reception of our Magazin
have thereby put it in our Power to extend our Plan beyond what we firſt propoſed. We
will be deemed an Inſtance of Gratitude in us (a Virtue we ſhall ever with the higheſt Pleaſu
tivate) that we have added to this, and ſhall continue in each future Number, a Quarte
Sheet of the* Lives of the Philoſophers, *in a Way proper for binding up by themſelves
Concluſion. We ſhall alſo continue to add a compleat Map of each County, done from the
Obſervations, and after a new Manner, proper to illuſtrate the* Natural Hiſtory. *The
ments for ſhewing the Weather will ſhortly be explained more fully: And every uſeful Hi
Direction we are favoured with from our Correſpondents, will be eſteemed a great F
and duly regarded.*

A Chronological Memoir *of* Occurrences.

For *JULY*, 1755.

Breſlaw in Sileſia.

THE Steeple of the Church of *Adelſback* was lately fired by Lightning; the Bells were melted, and the whole Edifice deſtroyed; but however, by the Vig
of the Inhabitants, the Church was
from being conſumed.

LONDON.

BY Advices from *Carolina*, dated *May* 26, we are informed, that the Aſſembly of that Province have granted 50,000 *l.* Currency towards fortifying *Charles Town.*

Whitehall, July 15. By Letters received from Vice Adm. *Boſcowen*, dated off
burg, 22d of *June*, 1755, there is an Acc
that on the 10th of that Month, the
and the *Lys*, two *French* Men of Wa
firſt carrying 64 Guns and 480 Men, a

laſt pierced for 64 Guns, but mounting only 22, and having 8 Companies of Land Forces on board, being ſeparated from the *French* Squadron under the Command of Mr. *Bois de la Mothe*, fell in with the *Engliſh* Fleet off the Banks of *Newfoundland*, and that a Skirmiſh happened between the ſaid *French* Men of War and his Majeſty's Ships the *Dunkirk* and *Defiance*, in which both the *Alcide* and *Lys* were taken. The *French* Ship the *Dauphin Royal*, which had been in Company with the two above mentioned, diſappeared in the Fog.

Extract of a Letter from on board the Terrible, *Capt.* William Holburne, *dated* June 21, 1755, *off* Louiſburgh.

"By the *Gibraltar*, which ſails to-morrow for *England*, I have juſt Time to tell you we joined Admiral *Boſcawen* yeſterday off *Cape Breton*, after a Paſſage of five Weeks and one Day. Ten Days before he took two *French* Men of War, &c.— We ſtood cloſe in this Morning to *Louiſburgh* Harbour, and found only five of their Ships got in with the Commander in the ſecond Poſt. The Commander in Chief, with eight Sail, is ſtill at Sea, ſo that we are in ſome Hopes of catching him, as there will be a Squadron kept cruizing off here for ſome time. *M'Namara* convoyed them but 200 Leagues, and returned again. Some of Admiral *Boſcawen*'s Ships are gone to *Halifax*: We go to-morrow with ſome more; and ſhall then come down and relieve *Boſcawen* and *Moſtyn*.— Admiral *Boſcawen* ſaw four Sail of *French* Men of War more, and chaſed, but loſt them in a Fog. We have a Snow with us, which was taken the other Day, bound to *Canada*."

Extract of a Letter from on board the Anſon, *Capt.* Mann, *in Adm.* Boſcawen's *Fleet*, June 21.

"The two *French* Ships taken by a Part of our Squadron are both new Ships, and ſent into *Halifax* in *Nova Scotia*, the Rendezvous of the Fleet. Beſides the ſeven Ships from *England*, which have joined us, we daily expect five more from *Virginia*. There were in all, by what we can learn, ſeven Ships of the Line of the *French*. We have ſince taken a Brig and a Snow, and carried them into *Halifax*. I judge the Admiral's Orders are to take all we meet with, by Reaſon he hath given our Captain Orders to fight every Thing we are able to engage with."

July 1. This Day the Parliament was prorogued to Thurſday, *Auguſt* 14.

4. His Royal Highneſs the Duke of Cumberland going to Portſmouth to ſee the Fleet, was this Morning at eight waited upon by the Lord Anſon, Sir Ed. Hawke, Vice Admiral Weſt, and the ſeveral Captains of his Majeſty's Ships, and with great Ceremony conducted to the Prince, a 90 Gun Ship, on board of which his Royal Highneſs dined. This was done with Flags flying, Drums beating, and all poſſible Demonſtrations of Joy and Reſpect. As ſoon as his Royal Highneſs went on board the Prince, the blue Flag was ſtruck, and his Royal Highneſs's Standard hoiſted at the Main-topmaſt-head; upon which all the Ships at Spithead ſaluted him with twenty-one Guns each. When his Royal Highneſs left the Ship his Standard was ſtruck, and the blue Flag hoiſted again; upon which the Prince ſaluted with twenty-one Guns, and all the Ships in the Fleet with the ſame Number, and the Admirals and Captains attending his Royal Highneſs back in their ſeveral Boats, in the ſame Order as that in which they went off.

5. This Morning his Royal Highneſs viewed the Fortifications, attended by the principal Engineer, and the General Officers: from thence he went to South-Sea Caſtle, and Cumberland and Port Bridge Forts, and returned to Portſmouth about 2 o'Clock; when the Governor, the Admirals, Sea Captains, General Officers, &c. were entertained at Dinner by his Royal Highneſs. In the Evening he reviewed the Marines on the Glacis.

6. This Morning his Royal Highneſs ſet out from Portſmouth, dined at Windſor Lodge, and in the Evening came to Town.

13. At the French Church in Threadneedle-ſtreet Mſr. *Normand* and Mad. *Marzeau*, both of that Nation, renounced the Errors of the Romiſh Church, before the whole Congregation. The Ceremony was very awful.

16. This Day there was a Trial of the Pix at Weſtminſter of all his Majeſty's Gold and Silver Coin, coined within the Tower of London, ſince July 1750, on which Occaſion moſt of the Lords of the Council were preſent. The Ld High Chancellor gave a moſt excellent Charge to the Gentlemen of the Jury, and then withdrew; as did the other Lords of the Council. Upon the Trial the Jury found all the Coins in Weight and Fineneſs perfect Standard, and reported them ſo accordingly.

22. About One o'Clock this Morning the *French* Ambaſſador ſet out for *France*.

MARRIAGE.

July 5. Sir Peter Leiceſter, Bart. to the Daughter of the late Sir Wm. Flemming, Bt.

DEATHS.

July 5. The Hon. Miſ. Molly Wenman, youngeſt Daughter to the Rt. Hon. the Lord and Lady Wenman.

13. The Rt. Rev. Dr. John Coneybeare, Biſhop of Briſtol, and Dean of Chriſt Church, Oxon.

B——KR——TS.

June 24. Thomas Glaſby, of St. Mary Iſlington, Victualler.

Tho. Cotton, of Staffordſhire, Ironmonger.

July 1. Charles Mackintoſh, of London, Merchant.

Joſ. Jaques, of Chippenham, Wilts, Grocer.

5. William Powell, of Charing-croſs, Hatter and Hoſier.

Theophilus Thurogood, of Chelmsford, Innholder.

George Bayley, of Mancheſter, Hoſier.

Owen Jones, of Fleet-ſtreet, Barber and Peruke-maker.

W. Stephenſon, of White-chapel, Victualler.

8. Edward Irwing, of Wincheſter, Linnen-draper.

Thomas Raynolds and Valentine Wright, of London, Lightermen and Dealers in Coals.

David Murray, of Weſtminſter, Taylor.

12. Edw. Jourdan, of Weſtminſter, Coach-maker.

Damaris Biſhop, of Fleet-ſtreet, Widow, Victualler.

Jacob Bright, jun. of Coventry, Worſted-weaver.

Francis Taylor, of Duke's Place, London, Vintner, and ſince of Mark-lane, Cutler and Dealer in Wines.

Tho. Manners, of Weſtminſter, Saleſman.

15 William Farguſon, of Newcaſtle upon Tyne, Mercer.

Samuel Holland, of Biſhopſgate-ſtreet, London, Druggiſt.

22. George Baſſett, of St. George, Hanover-ſquare, Druggiſt.

COURSE of EXCHANGE.

London, July 22, 1755.

Amſterdam, ———	36	7
Ditto at Sight, ———	36	4
Rotterdam, ———	36	8 2½ Uſ.
Antwerp, ———	no Price	
Hamburgh, ———	34	8
Paris, 1 Day's Date,	30	¾
Ditto, 2 Uſance, ———	30	½
Bourdeaux Ditto, ———	30	½
Cadiz, ———	38	⅜
Madrid, ———	38	⅜
Bilboa, ———	38	⅛
Leghorn, ———	47	⅛
Naples, ———	no Price	
Genoua, ———	46	⅞
Venice, ———	49	½ a 49
Liſbon, ———	5s.	4d ¾
Porto, ———	5s.	4d.
Dublin, ———	9	a ½

Account of Books in our next.

BILL *of Mortality from June* 17. *to July* 22.

Buried		Chriſtened	
Males 867 Females 923	1790	Males 664 Females 645	1309
Under 2 years old	680	Buried,	
Between 2 and 5	186	Within the walls	142
5 and 10 —	55	Without	415
10 and 20 —	54	*Mid.* and *Surry*	840
20 and 30 —	128	City & Sub. *Weſt.*	393
30 and 40 —	163		
40 and 50 —	150		1790
50 and 60 —	146		
60 and 70 —	108	Weekly *June* 24.	392
70 and 80 —	77	*July* 1.	358
80 and 90 —	32	8.	349
90 and 100 —	2	15.	352
100 and 109 —	0	22.	339
	1790		1790

Obſervat. on the Weather, at Temple Bar.

June		Barometer.	Therm.	Pluviameter.	Hygrometer.
	24	29 : 4	30½	24 : 7	10 Moiſt.
	25	29 : 9	30	0 : 6	19 Dry.
	26	29 : 9	31	0 : 0	4 M.
	27	29 : 8	30¾	0 : 8	6
	28	29 : 7½	31	2 : 9	16
	29	29 : 8½	30	0 : 0	14
	30	29 : 5	30	21 : 8	30 M.
July	1	29 : 4	30	18 : 7	42
	2	29 : 5	30½	9 : 5	29
	3	29 : 6	30½	0 : 0	23 D.
	4	29 : 9	29¾	0 : 0	22
	5	29 : 9¾	31	0 : 0	27
	6	30 : 0	31	0 : 0	6 M.
	7	30 : 0	29	28 : 4	7
	8	30 : 1	30½	24 : 2	11
	9	29 : 8	29½	1 : 2	12
	10	29 : 7	30	3 : 8	14
	11	29 : 7½	30½	1 : 2	4 D.
	12	29 : 9	31¼	0 : 0	2
	13	29 : 8	32	0 : 0	13
	14	29 : 9¾	31¼	0 : 0	23
	15	30 : 0	32½	0 : 0	34
	16	29 : 8¾	32	0 : 0	42
	17	30 : 0	31	0 : 0	22
	18	29 : 7¾	31	0 : 9	9 M.
	19	30 : 1	31½	0 : 0	13
	20	29 : 9	31½	5 : 5	17
	21	29 : 8	32¾	0 : 1	28
	22	29 : 6¼	3 ¾	12 : 4	35
	23	29 : 7	31¼	7 : 2	17
	24	29 : 7	28½	36 : 5	37

EACH DAY's *Price of* STOCKS, *in* JULY 1755.

☞ Books ſhut, is ſignified thus, ——

Days	BANK Stock.	E.-India	South Sea	S. Sea old An. 1ſt Su	S. Sea old A. 2d Sub.	S. Sea An. new 1ſt S.	S. Sea An. 2d Subſc.	3½ Ba. An 1ſt Subſc.	3½ Ba. An 2d Subſc.	3½ *per* C. India An.	Ba. 3 *per* Cents.	3 *per* Cent An. 1751.	3 *per* Cent India An.	India Bon. præm.	B. Cir. *per* *l. s. d.*	Lot. Tic. *l. s. d.*
23	No Price.	——	110¾	99⅞	98a⅛	——	——	99	97⅞a98	96⅞a97	99½a⅝	99	96¾	45s a 55	3 0 0	9 19 0
24	126¾a127	——	——	Do	Do	——	——	99⅛	98a⅛	96⅞a¾	99⅜a½	——	96⅝	55s	Do	Do
25	127	——	——	Do	98½a¼	——	——	99a⅛a99	Do	96¾	99¼a⅜	——	Do	54s a 55	3*l* a 3 2 6	Do
26	Do	——	——	Do	Do	——	——	99a⅛	Do	96⅝	99	——	Do	55s	3 0 0	Do
27	126¾	——	——	99⅞a100	98⅛	——	——	99a98⅞	97⅞a98	96⅝a¾	99a98⅞	——	96½a⅝	54s a 55	3*l* a 3 2 6	9 18 6
28	Do	——	——	Do	98⅛a¼	——	——	98⅞a99	Do	Do	——	——	Do	Do	Do	Do
29	Sunday															
30	No Price.	——	——	98⅞	98⅛	——	——	98⅞a¾	97¾	96⅝	——	——	96½	53s a 54	3 2 6	Do
1	126½	——	——	99¾	86	——	——	98½a⅝	97½a⅝	96¼	——	——	96	52s a 51	Do	9 18 0
2	Do	——	——	99⅜a¾	98⅞a98	——	——	98½a⅜	97½	96a⅛	——	——	Do	48s a 47	Do	9 17 0
3	126	——	——	Do	97¼	——	——	98⅛a½	97⅜a½	95¾	——	——	95½	47s a 50	Do	9 16 6
4	No Price.	——	——	99¾a⅞	97¾a⅞	——	——	98½a⅜	97½	95⅞	——	——	Do	50s	Do	Do
5	Do	——	——	99¼	Do	——	——	98⅜	97⅝a½	95¾	——	——	Do	49s	Do	Do
6	Sunday															
7	No Price.	——	——	94¼	97¾a⅞	——	——	98¼a⅜	97⅜	95⅞a96	——	——	95⅝	50s	3 5 0	Do
8	125⅞	——	——	99⅝a¾	97¼	——	——	98⅛a98	97⅛	95⅞a¾	——	——	95½a⅝	49s a 50	Do	Do
9	125½	——	——	No Price.	97½	——	——	97⅝	96⅝	95⅝a¾	——	——	Do	50s	Do	9 16 0
10	125¾	——	——	98⅞a99	No Price.	——	——	97¾a⅝	Do	95¾	——	——	95½	49s a 50	3 7 6	9 15 6
11	125⅝	——	——	98a98⅞	Do	——	——	97⅝	96½a⅝	95⅝	——	——	Do	Do	Do	Do
12	125½a¾	——	——	98⅞	96¾a⅝	——	——	97½	96⅝	Do	——	——	95⅜a½	50s	Do	9 14 6
13	Sunday															
14	125½	——	——	No Price.	No Price.	——	——	97¼a⅛	96	95¼a⅜	——	94½a¾	95⅛	49s a 50	3 2 6	9 13 0
15	124	——	——	96¾	Do	——	——	96½a94¾	No Price.	94¾a93	——	No Price.	No Price.	50s a 46	3 7 0	9 10 6
16	124¼	——	——	Do	94¾	——	——	94¾a⅛	Do	93	——	Do	93	47s	3 7 6	Do
17	124	——	——	96½	No Price.	——	——	94¼	94a¼	Do	——	93⅛	98⅛a93	47s a 46	Do	9 11 0
18	123⅜	——	——	96¼a⅜	Do	——	——	94a93¾	No Price.	92⅜a½	——	No Price.	92¼	43s	No Price.	9 10 6
19	No Price.	——	——	95¼	92¾a½	——	——	92¾	95⅛	92a¼	——	Do	92	40s	Do	9 9 6
20	Sunday															
21	Do	——	——	No Price.	No Price.	——	——	98⅛	92	93¾	——	92a91⅞	91⅜	35s	Do	9 10 0
22	122½a122	166a165½	——	94	Do	——	——	92⅜a⅝	91⅝a½	91¼a91	——	No Price.	91	30s a 28	3 7 6	Do

London. W. Pec. Loaf 19d } Prices Corn. {	Mark-Lane.	Baſingſtoke.	Reading.	Farnham.	Henley.	Guildford.	Warminſter.	Devizes.	Glouceſter.
Wheat	23s to 25s qr.	110s to 135s lo.	130s to 152s lo.	126s to 135 load	137s to 15[illegible]s lo.	07l 7s 6d load	27s to 32s qr.	25s to 34s qr.	4s 10d to 5s b
Barley	11s to 13s 0d	13s to 14s 6d q.	14s to 17s 0d qr	15s to 16s 0d q.	15s to 16s 0d q.	15s to 16s 0d qr	13s to 16s	14s to 15s	2s to 2s 2d
Oats	10s to 12s 3d	13s to 16s 0d	14s to 20s 0d	14s to 15s 6d	13s to 17s 0d	12s to 13s 6d	11s to 13s	12s to 13s	1s 6d to 1s 8d
Beans	16s to 17s 0d	19s to 21s 6d	19s to 23s 0d	19s to 22s 0d	21s 9d to 23s 0d	24s to 26s	23s to 28s	24s to 27s	2s 8d to 3s 2d

Iiſcellaneous Correſpondence, in Proſe and Verſe.

For *AUGUST*, 1755.

'ear and ſuccinct Account of NORTH AMERICA, ;iſtorical, Geographical, &c. *continued from Page* 112.

ecticut is divided into *five counties*, and
i them are ſixty-eight *town ſhips*. As
les from ſixteen to ſeventy pay a poll-
heir numbers may be the more readily
ited; as it may again by the number of
Ailitia, which are from the age of ſix-
o fifty, and in 1749, were 16,000,
.number multiplied by five, ſeems to
; full amount, being 80,000, but this
much over balances *Canada*, by an ac-
we are certain in, as is that of the
a.

ing again the *four provinces* together,
iave many advantages over *Canada* in
ilimate and ſituation for trade, having
n ſeven fine navigable rivers and ca-
is harbours eaſily entered, and as
arry on a great traffic, are probably
and more at eaſe than the *French*, and
ore likely to be more reſorted to, and
pagate faſter.

w-York government was found in
to contain 65,000 inhabitants, and the
in the *city* to be 1500, and is ſaid ſince
e received a conſiderable *foreign* in-
, but that being ſo ſhort a ſpace paſt,
iot, as ſome writers have done, think
iking them now to be 100,000, not
the poſſibility of ſuch an increaſe, even
ſe the town is calculated ſeparately,
ideed I ſhould imagine that 80,000 is
iple ſum, and more than my calcula-
vill admit, even ſuppoſe a miſtake in
uthority of ten years forward. This
has ſomething the advantage of *Boſton*,
ving equally a fine harbour and that
r open in the winter, which is a con-
ble article in point of trade, it being
; lat. 40° 40′—weſt long. 47° 4′, ſeat-
an iſland at the mouth of *Hudſon*'s ri-
about fourteen miles long and about
broad; the province is divided into ten
ies, of which *Albany* makes the moſt
lerable figure except *New-York*, as its
town of the ſame name is the frontier
; colony to the north, and for that rea-
rtified and garriſon'd, and is about one
red and fifty miles up *Hudſon*'s river a-
'ork city. Here likewiſe moſt uſually the *Sachems* or *chiefs* of the *Iroquois* meet the governors of our *northern colonies* to renew their alliances, and concert meaſures for their mutual defence againſt the common enemy.

New Jersey, or more properly the *eaſt* and *weſt* Jerseys; *eaſt Jerſey* extends one part along the ſea coaſt, and the other on *Hudſon's river*, from a certain *port* called little *Egg-harbour*, to that part of the ſame river that is in lat. 41. divided from *weſt Jerſey* by a line drawn from *Egg-harbour*, or *Creſwick* river, *Stony* river, and the ſouth branch of *Baritan*. Its extent on the *coaſt*, and on *Hudſon's river* is about 100 miles, its breadth very unequal; *weſt Jerſey* is divided from it again by a *north* and *ſouth* line, and together contain, or are divided into eight counties, ſome ſay twelve; I do not know which is right. The principal town of *eaſt Jerſey* is *Amboy*, at the mouth of the river *Baritan*, and the capital of *weſt Jerſey* is *Burlington*, ſeated on an iſland in the middle of *Delawar* river, to the northward of *Philadelphia*. The computation of inhabitants in both the *Jerſeys* 1749 was 50,000, but I am pretty well informed, that is the utmoſt at this time.

Pensilvania, though one of the lateſt planted colonies, has by a rapid increaſe, but one way to be accounted for, become of a ſudden the moſt populous of all the *Britiſh colonies*. It is divided from the *Jerſeys* by the river *Delawar*, that has its ſource amongſt the *Iroquois*, and is navigable about two hundred miles. *Philadelphia* is the *capital*, and generally eſteemed the fineſt town in the *Britiſh dominions* conſidered all together, it is ſeated in lat. 40° 30′. The form is an oblong of *two miles*, extending from the river *Delawar* to another called *Schoolkill*, and each front to theſe rivers *one mile*. In the *centre* of the *town* is a ſquare of *ten acres*, and each quarter of the city a ſquare of *eight acres*. *The main ſtreet* is one hundred feet wide, parallel to which is eight ſtreets, four on each ſide, and theſe are traverſed at right angles by twenty more, all of 30 feet wide, with a fine *quay*, and other *maritime* conveniencies; the *houſes* are generally *built* of *brick*, well *glazed*, and covered, inſtead of ſlate or tile, with a kind of clap-board ſawn into ſquares. In 1749 the number of houſes were *two thouſand* and *ſeventy-ſix*, with *eleven* houſes of *public* worſhip; and in 1753, they were ſaid to be increaſed to *two thouſand three hundred*, or there abouts, A little before *king William*'s death, the inhabitants were ſcarcely 14000—the increaſe by *Engliſh* ſince that time, from *England*, and in the colony, is about 126,000—and by foreigners, chiefly *Germans*, about 110,000, in all 250,000; the neareſt computation of the preſent ſubſiſting inhabitants.

MARYLAND, the next adjoining colony, is ſituate between lat. 38 and 40°, long. 44 and 48°. The north end of the *bay* of *Cheſepeak* divides *Maryland* into two parts, called the *eaſtern* and *weſtern* ſhores. It is bounded on the eaſt by part of *Penſilvania* and the *Atlantic ocean*, on the ſouth by *Virginia*, and on the weſt by the *Apalachean* mountains, the extent from north to ſouth is about 140 miles, and from eaſt to weſt, as it reſpects what is really ſettled, about 100 miles. There has not been any exact account taken of the *white inhabitants*, for there being no conſiderable towns, we can only gueſs at the number, by an account we have of *Virginia*, which being computed at *ninety thouſand*, and this province rather fewer, we ſuppoſe there may be about 85,000.

VIRGINIA is ſituate between 36 and 39°, lat. 74 and 60° long. It has the river *Potowmac* on the N. E. the *Atlantic* ocean on the eaſt, *Carolina* on the ſouth, and the *Apalachean* mountains on the weſt, extending from north to ſouth about 240 miles, and from eaſt to weſt about 120 miles ſettled. In this *colony*, as in *Maryland*, there are not any noted towns, the inhabitants living much diſperſed for the convenience of enlarging their plantations, ſo that our computation of inhabitants reſults principally from the *Militia* roll, by which, and accounting exempts, *&c.* we ſay, as before, that the amount is about *ninety thouſand*.

CAROLINA is divided into two provinces, the *north* and *ſouth*; *north Carolina* is bounded by *Virginia* on the *north*, the *ocean* on the *eaſt*, by a line drawn in 34 degrees from the *ocean* to the *mountains* on the ſouth, and by that part of *Florida* poſſeſſed by the *Indians* on the *weſt*, and is divided into fourteen *pariſhes* or *townſhips*; but we do not hear of any *church* or *town* of note in the country.

South Carolina is divided from the *north*, by the aboveſaid imaginary line, by the *ocean* on the *eaſt*; by the river *Savannah*, which ſeparates it from *Georgia*, on the *ſouth*, and by the *Indian country* on the *weſt*.

The *capital* of both *Carolinas* is *Charles town*, ſituate in 32 degrees 45 minutes, it had in 1739, 450 houſes, and a conſiderable number of warehouſes; it was then burnt down, and has been ſince rebuilt handſomer, and now has about *ſix hundred houſes*. It is thought that there are more inhabitants in the *north* than in *South Carolina*, though not any ſignificant towns; ſome ſay, that in the *north* are 45000 whites, but as it is agreed that the two provinces do not conſiderably differ, and as in *South Carolina* their *Militia* is not above 5000, therefore giving the *north provinces* 35000, and the *ſouth* 30,000, ſeems to be nearer a right calculation than any ~~now~~ extant.

Georgia is bounded by the *Savannah river* on the *north*, by the *Indian country* on the *weſt*, by a line drawn athwart the upper part of the *Peninſula* of *Florida* to the out-fall of the river *San Matheo* on the *ſouth*, and by the *Atlantic ocean* on the *eaſt*, between the lat. 30° 35′ and 32° 15′, or thereabouts, As this is but a modern ſettlement, and has varied in a ſhort ſpace very conſiderably, the neareſt computation of ~~its inh~~abitants is about 6000.

This is the loweſt computation ever made of the *inhabitants* of *America*, and I have ſome reaſon to think it much nearer the truth than any other extant—The amount then of whites is 986,000—One ſixth of theſe males capable of labour, or what are uſually called fighting men, is 164,200, and ſuppoſe, as is calculated on the part of *France*, one fourth of theſe may on proper emergencies be ſpared for the war, amount to 41050, nearly the number of all the inhabitants in *New France*, except *Louiſiana*, not eſteemed to have more than *ſix* or *ſeven thouſand* inhabitants, including the *auxiliary Indians*. And the reader will readily perceive that my computation is highly in favour of *France*, and conſequently, that the *French* power on that ſide, is rather to be guarded againſt in the increaſe, than in any reſpect to terrify us in the preſent, and that it is more our buſineſs to deſtroy the forts they erect, than to build any of our own. And as that upon the *Ohio* and at *Crown-point* ſeem the moſt terrible, I ſhall now, by way of concluſion, attempt to open that matter to the reader.

Crown-point, as has been obſerved before, is at the head of the LAKE *Champlain*, and as we underſtand it within the province of *New Hampſhire*, and being on the frontier of our ſtrongeſt colonies, is very differently conſtructed and garriſoned from any other on that ſide. The *French* propoſe by this, at once to interrupt our *back trade* with the

Indians, and to make it a kind of *frontier* garriſon to the country they have invaded on the ſouth ſide of St. *Laurence* river, where we ſay, they have not a right to be at all, but as this *fort* neighbours on *New Hampſhire* ſettlements, and is in the country of the *Iroquois*. It ſeems wonderful how it happened, that either the *Engliſh* or *Indians* permitted the *French* to build a fort there, as I cannot find a clear account of this matter, it is very natural to conclude, a ſtrange *indolence* or *negligence* ſomewhere; however, as that does not regard our preſent enquiry, it may not be amiſs to obſerve, that thoſe who are ſaid to be ready and able to take QUEBEC, cannot be under any difficulty in deſtroying a fort, not in any reſpect of equal capacity to reſiſt, and at certain ſeaſons of the year incapable of reinforcement, and as with the deſtruction of this fort, all complaints againſt the *French* will ceaſe on that ſide, the execution ſeems ſpeedily neceſſary.

The *fort* or *forts* on the *Ohio*, I know not which, for all our accounts are ſtrangely confuſed, the river whereon one or more is, or are erected by the *French*, is properly within the province of *Virginia*. This famous river has its ſource in ſome ſmall lakes on the back of *New York* province, to the weſtward of the *Alligany* mountains, *ſouth* of the *Iroquois*, and *eaſt* of the lake *Errie*, its courſe is neareſt *ſouth weſt*, ſupplied with various ſtreams, and paſſing through a fine country for ſeveral hundred miles long, in about the lat. 37° and long. of 89°, it falls into the great *river Miſſiſipi*.

The chief inhabitants about this river at preſent, are the *Twigtwis*, equal in number to the *Iroquois*, and equally free and independant, with this nation or others on the *Ohio*. The *Engliſh* have traded for near a century, but the *French* having ever ſince their firſt ſettlement on the *Miſſiſipi* in 1699, been *crawling* up that *river*, and *building forts* as they proceeded, at length got into the OHIO, and there erected what we are now contending about. But here again we are under the ſame amazement as at *Crown-point*, for our writers tell us, that when the *Engliſh* only propoſed to build a *fort* on that *river*, the *natives* even took the attempt amiſs, though our friends, and were determined to prevent it; and as they ſay at the ſame time, that the *French* had no particular friendſhip with them, yet that they permitted the FRENCH to build thoſe in diſpute; nor as I can find, are they deſirous that we ſhould deſtroy them, which ſeems truely problematical.

In *anſwer* to this, one of our late writers on the ſubject, gives the following extraordinary reaſon.—" He ſays, it is probable the *French* would not have been able to compaſs their purpoſe, had not the *Indians* either ſtood neuter, or deſerted our party; the reaſon of their ſo deſerting us ſeems to be, that we propoſed to have built a *fort* and meaſured out ſome *lands*, therefore no wonder they ſhould take part with the *French*, who openly declared their deſign of eſtabliſhing themſelves, than with the *Engliſh* who were clandeſtinely depriving them of their lands, at the time they profeſſed friendſhip," which reaſoning in brief is this. That thoſe who robbed the *Indians* publickly, were leſs culpable in their opinions, than thoſe who privately intended it; perhaps this may be the *Indian* way of reaſoning, but it may not be amiſs to ſay there is ſomething *ſavage* in it. For though I would not juſtify fraud, yet I do not conceive how an *intention* to commit it, is worſe than an *act* of *violence*.

In ſhort, until theſe matters are better cleared up, or better reaſons given, why, or wherefore this or that has happened, ſo much in favour of the *French*, and to our detriment, we muſt conclude againſt ourſelves, that the *French* are either more *fair* in their dealings, more *ſkilful* managers, or *more diligent* in the *execution* of their purpoſes; or that while the *Engliſh* are cloſely attending to the improving what they have, the *French* alacrity is carrying them on, to graſp at what they have no means of improving. Theſe *ideal* purſuits of that *volatile* nation have a very bad effect on the *phlegmatic* diſpoſition of the *Engliſh*, and figures their flights according to our own poet thus.

Sometimes we ſee a cloud *that's dragoniſh,*
A vapour *ſometimes like a* bear, *or* lion,
A tower'd citadel, *or pendant rock,*
A forked mountain, or blue promontory
With trees upon't, that nod unto the world
And mock our eyes with air.

At the ſame time, as theſe *flying people*, by a piece of dextrous ſmithery, *link two colonies together* of at leaſt *twelve hundred* miles diſtance, and propoſe after the examples of *Cortez* and *Pizarro*, to command ſuch an extent of country with a handful of men, againſt all the reaſons of number, courage, and ſkill, we may ſay of the *Frenchman*, as *Juvenal* of the *Greek*.

———————— *Omnia novit*
——————— *In cælum Juſſeris, ibit.*
——————— *All things he knows,*
And bid him fly to heaven, to heav'n he goes.

Between GEORGIA and the *Miſſiſipi* is the *Peninſula* of *Florida*, in poſſeſſion of the *Spaniards*, and hath one *town* on it ſlightly fortified, called St. *Auguſtine*; the boundary of this little province is marked off on the map as obſerved before by a pricked line, ſo that the *Spaniards* have it very diſtinct and entire from any way interfering with either the *Engliſh* or *French*; between the *Peninſula* and the *Miſſiſipi* are ſeveral ſtreams that empty themſelves into the *gulph* of *Mexico*, but none navigable by ſhipping.

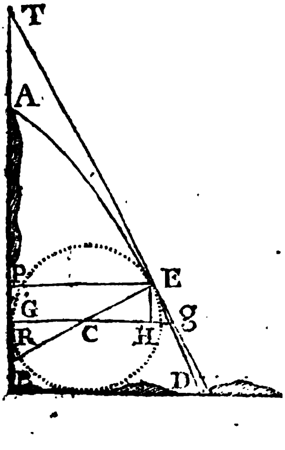
The *Miſſiſippi*, as the *French* report, has its ſource in the vicinity of *Canada*. Its firſt courſe is to the *S. E.* and in the lat. of 45° turns almoſt due ſouth, continuing that courſe until in the lat. 30° and long. 95° it diſcharges itſelf into the *gulph* of *Mexico*, where it has ſeveral openings occaſioned by various ſand banks, that in ſome meaſure bar the entrance. The notion of writers is, that none but ſmall ſhips can enter, but we are apprized of the contrary, by the *French ſhips* that trade there.

The ſettlement of this country, by the *French*, is ſo late as 1712, and the *Spaniards* permitting it, conſidering the ſituation, can only be accounted for by the unhappy *connection* of intereſts at that time between the *courts* of *France* and *Spain*; however it doth not appear their progreſs has been very ſwift, nor can the trade be very important to *France*, as the climate is calculated only to raiſe ſuch commodities as would prejudice thoſe at home, and therefore muſt chiefly depend on an illicit trade with the *Spaniards*, which is indeed what the colony principally ſubſiſts by.

The only *town* in this *province* is *New Orleans*, ſeated about *one hundred* and *twenty* miles up the ſtream, it was founded in 1717, but not much inhabited until after the famous *Miſſiſipi* bubble, when it falling into the hands of the crown, it became conſiderably improved and fortified. The *patentees* had before built a *fort* at the mouth of the river, and ſince there have been two more conſiderably above *New Orleans*, for the benefit of trade. I do not any where find a preciſe *ſtate* of this *town* at preſent, but it is generally ſuppoſed to be about the ſize of *Charles town* in *South Carolina*; it has one way or another a very pretty trade, and may probably contain between *two* and *three thouſand inhabitants*, and the whole colony about 4 or 5000 whites, the utmoſt we have been able to diſcover. That they have an *illicit trade* with the *Spaniards* is out of doubt, from prizes taken in the late war; but this is ſaid to be only carried on by particular people, by ſome authority, and the generality little the better for it. And in concluſion, it is to be obſerved, that if it be convenient for the *Spaniards* to tranſmit their private property this way from *New Mexico*, they will certainly do it, as a conſiderable *ſaving* in both *freight* and *indulto*, and the *French* at the ſame time be handſome gainers, by *freight*, *commiſſion* and *remittance*; but this may one day convince both *Spaniards* and *Engliſh*, that the *court* of *France* acted wiſely when they made this ſettlement, and which on our part is only now to be amended, by preventing any kind of union between this colony and CANADA.

MATHEMATICAL QUESTIONS *Anſwered.*

Queſtion 15, *anſwered by Mr.* JOHN SHIPMAN.



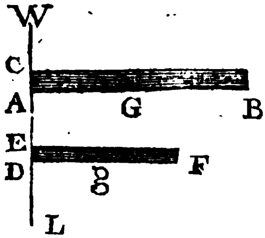
PUT AB $= 30 = a$, BD $= 20 = b$, AP $= x$, PE $= y$, and PG $=$ EH $= z$; then $2x + z =$ TG $=$ TE, Parameter $= \frac{b^2}{a} = \frac{40}{3} = p$, and by ſim. $\triangle$'s $y : 2x + z :: z : \frac{2xz + z^2}{y} =$ CE, and $\frac{1}{2}p$ (PR) $: y :: z : \frac{2yz}{p} =$ CH, $\therefore y - \frac{2yz}{p} =$ GC $=$ CE, moreover $a - x - z =$ GB $=$ CE. Whence $y - \frac{2yz}{p} = \frac{2xz + z^2}{y}$; $y - \frac{2yz}{p} = a - x - z$; and by the Nature of the Parabola $px = y^2$; from which three Equations, x and z being exterminated, we have

$$8y^5 + \overline{8p - p^2} \times y^4 - \overline{8p^2 - 8ap - 2p^3} \times y^3 + \overline{p^3 + 4ap + 2ap^3 - p^4} \times y^2 + 2p^3ay = a^2p^4.$$

From which Equation, y may be found, and conſequently all the reſt.

Mr. Charles Wildbore ſays, that the greateſt Circle inſcribed in a Semi-parabola will be, when GB = ½ the Circle's Diameter; and hence, by an eaſy Proceſs, finds the Diameter of the Wheel = 17 Feet nearly.

Queſtion 16, *anſwered by Mr.* John Shipman.



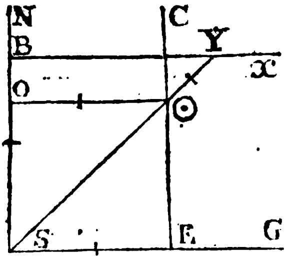
LET the two Beams AB and DF be fixed in the immoveable Wall WL; biſect AB in G, and DF in *g*, which Points will repreſent their Centers of Gravity; and ſuppoſe the Weight of each Beam to be accumulated in G and *g* reſpectively.

Put AB = 15 = a, AC = 1,5 = b, and DF = 10 = c, DE = 1 = d. Then, the whole Force which tends to break the greater Beam at A, is $= \frac{a^2 b^2}{2}$; and that which tends to break the leſſer at D, is $= \frac{c^2 d^2}{2}$; that is, the Streſs at A, is to that at D as $a^2 b^2$ to $c^2 d^2$, or as $a^2 b^2$ to c^2 (becauſe $d = 1$). But the Number of longitudinal Fibres, whoſe Adheſion tends to preſerve the greater Beam from breaking is $= b^2$; and the Number of ſuch Fibres in the leſſer Beam $= d^2$: Now if GAC and *g*DE be conſidered as bended Levers, the whole Effort which tends to preſerve the greater Beam from breaking will be $= \frac{b^3}{2}$, and that of the leſſer $= \frac{d^3}{2}$. Whence, the abſolute Strength of the greater Beam $= \frac{b^3}{2a^2b^2} = \frac{b}{2a^2}$, and that of the leſſer $= \frac{d^3}{2c^2d^2} = \frac{d}{2c^2}$; hence, the abſolute Strength of AB is to that of DF as $\frac{1}{300}$ to $\frac{1}{200}$, or 2 to 3; conſequently, the Strength of the leſſer Beam exceeds that of the greater, by half the Strength of the greater Beam.

Mr. Charles Wildbore's *Anſwer.*

IT is generally allowed that the Strength of Timber (independent of the Streſs) is as the Content: Now if a Piece of Timber 10 Feet long, and 1 Foot ſquare, will bear 457143 *lb.* in the Middle before it breaks; one of 15 Feet long, and 1 ½ ſquare will bear 1542857 *lb.* Now allowing a Cubic Foot of Oak to weigh 56 *lb.* and that the Streſs of Timber is as the Content drawn into the Length; we have 5600 *lb.* for the Streſs of the leſſer Piece, and 28350 *lb.* the Streſs on the greater (allowing them to be ſupported horizontally at both Ends): From which the Weight that each will bear is found, and the Greater will bear more than the Leſs = 1062964 *lb.*

Queſtion 17, *anſwered by* J. D. G. N.



DRAW the indefinite Line SG East, ſet off the given Departure = 84 Miles from S. to E. at S likewiſe draw the indefinite Perpendicular SN, then ſet off the Diff. Latitude = 100 Miles from S to B, from B draw the indefinite Lines BX, on E draw the Perpendicular EC infinite; and in your Compaſſes take the Diſtance run after the Departure was taken = 34 Miles; then, by a Pin as a Centre at ⊙ turn the Compaſſes with one Foot in ⊙ in the Line EC till the other Foot falls on the Line BX, as at Y; then SY is the Diſtance ſailed = 148 Miles. *Per* Trig. we have the Angle of Courſe = BSY, North-Eaſt, 2° 30′ more Eaſt.

New QUESTIONS *to be anſwered.*

Queſtion 39. *By* TYCHO, *jun.*

IN how many Years to come will our Pole Star be neareſt to the Sun, and how many Degrees and Minutes will the Diſtance be?

Queſtion 40. *By Mr.* T. WOOD.

GIven the three neareſt Diſtances from the three Angles of a plane Triangle to the Circumference of the inſcribed Circle = 20, 30, and 40, to find the Circle and Triangle.

Queſtion 41.
By Maſter SLADE, *of the Academy at* Deptford.

IF a Merchant Ship ſets Sail from *Breſt*, and a Privateer ſets Sail from the *Lizard* at the ſame Time, the former ſailing 8 Miles *per* Hour, and the latter be able to ſhape a S. S. Weſt Courſe; How many Miles *per* Hour muſt the latter ſail to meet the former, and at what Diſtance and Time?

Queſtion 42.
By Mr. CHARLES WILDBORE.

THE greateſt Cylinder that can be inſcribed in, and the leaſt Cone than can be circumſcribed about the Solid generated by the Revolution of a given Curve, will be when the Subtangent is equal to twice the Altitude of the Cylinder, or two Thirds of the Altitude of the Cone. Quære, the Demonſtration geometrically?

Queſtion 43.
By Mr. CHARLES WILDBORE.

IN a plane Triangle there is given the Difference between the Sum of it's Sides and Baſe $= 3107.7 = d$, the Difference of the Angles at Baſe $= 25° = a$, and the Area $= 157145 = s$. Quære, the Sides and Angles?

Queſtion 44.
By Mr. JOHN GOODHEAD.

GIven the Length of the ſlant Side of a Cone $= 20$ Inches $= s$. Required the Area of the greateſt Parabola that can be cut from ſuch a Cone, when the Solidity of the Cone is a Maximum?

Queſtion 45.
By Mr. ABRAHAM STONE, *of* Chatham.

IN the Trapezia ABCD are given the Side AB $= 5.00 = a$ Chains *per Gunter*, BC $= 8.00 = b$, and CD $= 11.00 = c$. Quære the Side AD, the Angles A, B, C, and D, and the Area in Acres, when the Field is the greateſt poſſible under the given Dimenſions.

Queſtion 46.
By Mr. THO. BARKER *of* Brampton, Suffolk.

GIven the Area of a plain Triangle $= a$, and the Difference of the Segments of the Baſe $= b$: Quære the Triangle, when the Perpendicular, Baſe, and Sides are in Arithmetical Progreſſion.

Queſtion 47.
By Mr. GEORGE MURRANT.

HAving the Perimeter, and Difference between the longeſt, and each of the other two Sides, to find the Sides of a Triangle.

Queſtion 48.
By Mr. CHARLES DYER.

GIven the Radii a, b, and c, of three Circles inſcribed in the Corners of a Triangle: Required a Theorem to determine the Radius of a fourth Circle, which being inſcribed in the ſame Triangle, ſhall touch the Convexity of thoſe three given Circles.

Queſtion 49.
By Mr. THOMAS TODD *of* Weſt-Smithfield.

GIven the Solidity of any regular Polygonal Pyramid $= s$, the Number of Sides $= n$, to find the Dimenſions when the whole Surface (including that of the Baſe) is a Minimum.

Queſtion 50.
By Mr. EDW. JOHNSON, *Teacher of Mathematics, at* Hull.

THE Equation of a Curve being $\overline{y-a} \times a^2 = x^2 y$, its Area $= 100$, and $a = 12$; Quære x the Abſciſs?

A Deſcrip-

A Deſcription of the Nature and Conſtruction of the LYRICHORD.

IT is preſumed that moſt of our Readers either underſtand or delight in Muſic, or at leaſt will be pleaſed with an Account and Deſcription of the Lyrichord, which, (to uſe the Inventor's own Words) is the moſt curious muſical Inſtrument ever invented; we are told by him, that it has coſt him 500 Pounds and 20 Years Study and Application to compleat it, and that it is now brought to a great Degree of Perfection. That it imitates the *Violin*, *Baſs-Violin* and *Duble Baſs*; and tho' it has no *Pipes*, yet, when play'd full, it reſembles a perfect *Organ*; and is touch'd by *Keys*, like an *Harpſichord*. That it admits of playing *loud* and *ſoft*, and the *cloſe Shake*; as alſo of *ſwelling* any ſingle Note or many Notes together by the ſingle Preſſure of the Fingers. But, (what is moſt of all ſurprizing, and indeed incredible if not ſeen, yet plainly demonſtrable to every one) *its Strings never go out of Tune*, as long as the Materials of which the Inſtrument conſiſts remain entire. A Thing hitherto deem'd impoſſible to find out.

This is the Author's Account of his Machine, to make good which, and to gratify the Curioſity of the Public, we have given a Perſpective of the Whole laid open, and ſhall here ſubjoin a conciſe Deſcription of the eſſential Parts thereof, having firſt premiſed, that they conſiſt of five Syſtems of Strings; each Syſtem of three Bars or Sets of Strings; and four Strings in each, except one Set of the longeſt of all, which has but 3 Strings; ſo that upon the whole there are 59 Strings in the Inſtrument. Theſe Strings are ſeverally ſtretched by Weights appended to Levers, and made to ſound by being drawn down on the Periphery of moving Wheels to be *touch'd* by them inſtead of the *Quills* in a common *Harpſichord*, or a *Bow* in the *Violin-kind*. Therefore,

a b e f repreſents the Syſtem of 59 Braſs Levers; on the inmoſt End of each Lever is Part of the Circumference of a Circle (ſomewhat more than a Quadrant) in the Centre of which Circle is an Axis upon which the Lever is ſupported and moves on a proper *Fulcrum*. Theſe circular Parts all appear in a Row from *e* to *f*.

From *a* to *b* on the under Side of each Lever is hung a long cylindric Weight of Lead about an Inch in Diameter, more or leſs, which anſwers the Purpoſe of a *Ballance* or *Poiſe* to the Lever when barely connected with the String.

From *c* to *d* appear the *Screws* by which large Weights are moved forwards and backwards on the Levers, proportion'd in ſuch a Manner as to give a *due Degree of Tenſion* to each reſpective String. In *tuning* the Inſtrument theſe Screws are moved with a Key, and conſequently the Weight, till the String acquires its proper Tone; and when once they are put in Tune, they muſt always remain ſo, (unleſs diſordered by Accident) becauſe they are always under the ſame Degree of Tenſion from the equal Action of the Weights. And in this conſiſts the *peculiar Nature* and *Artifice* of the Lyrichord. Note, the *Weights* we now ſpeak of, are long, wide, and thin, that they may move freely by each other under the Levers.

From *e* to *f* appear the *circular Arches* at the End of the Levers, as was ſaid before; in each of theſe a Pin is fix'd near the Lever, on which is put the Loop of *Braſs Wires*, or *Silken Strings*, which on the other End are connected with the *muſical Strings*, and by which they are ſtretch'd, and eaſily taken on or off.

From *i* to *k* are the *Bridges* on which the Strings are ſtrain'd in each Syſtem, and which terminate their muſical Length on this Part.

From *l* to *m* is a Row of *Braſs Jacks* (as we may call them) one to each String, which hang upon the String by two Hooks; and when put into Motion, draw the String down on the Wheel. They are put into Motion by the Keys which are touch'd by the Hand of the Muſician as in a Harpſichord; only, by a double Lever below, theſe move downward, as they, by a ſingle one, move upwards. The Hooks on the Tops of the Jacks are adapted to the Strings, by a *Nut* and *Screw*.

In the open Part *n o p q* are placed the *Wheels* and *Pulleys* on an Axle about 5 or 6 Inches long, and ſo that the Perimeter of the Wheels in each Set is but a little below the Strings; for *one Wheel* ſuffices for a Set of 4 Strings; there are therefore 3 Wheels in a Syſtem, and 15 in the whole. The Surfaces of theſe are fitted in a proper Manner to ſtrike the Strings when by the Jacks they are drawn down upon them for a *momentary Touch*. Inſtead of *Roſin* they apply *Tallow*, ſometimes, to the Surface of the Wheels. They are about 4 Inches in Diameter and moved by the Machinery within-ſide, all at once, and with different Velocities, thoſe which touch the ſhorteſt Strings moving faſteſt. When the Machine is wound up, they are all ſet a going by a great Weight on the Back-part of the Inſtrument.

In the Space *p q r s* lie all the Syſtems of Strings, ſome of which are Wire, others Catgutt, and the largeſt Sort wrought or cover'd with Silver-wire, like thoſe of

Jonas

the largeſt *Baſs-Violins*. Between the Bridges, the longeſt Strings are about 30 Inches, and the ſhorteſt about 6; as near as we can recollect, having ſeen this Inſtrument but once.

The *Lid* or *Cover* of the Inſtrument conſiſts of *two Parts*; in Playing, one is ſhut down generally, and the other, which lies over the Strings, is moveable up and down by the Foot of the Muſician, by which Means he can *ſwell the Notes*, and make them *louder* or *ſofter* at Pleaſure.

What farther relates to this ſingular and curious Invention muſt be deferr'd 'till we come to treat of the *Philoſophy* of *Muſic*; in the mean time we hope an Idea thereof will not be difficult from this Repreſentation; and ſuch as have Opportunity, and Taſte, will, we imagine, find it well worth their While to ſee the Inſtrument itſelf.

EPISTOLARY STANZAS

From Miſs *Eliz. Carter* to Miſs *H—ll.*

WHILE ſoft thro' water, earth and air
The vernal ſpirits rove,
From noiſe, my dear, and giddy crowds
To rural ſcenes remove:
The mountain Snows are all diſſolv'd,
And huſh'd the bluſt'ring gale,
While fragrant Zephyrs gently breathe
Along the flow'ry vale.
The circling planets conſtant rounds
The wintry waſtes repair,
And ſtill from temporary death
Renew the verdant year.
But ah! when once our tranſient youth,
(The ſpring of life) is o'er;
That ſmiling ſeaſon takes its flight,
And muſt return no more!
Yet judge by reaſon's ſober rules,
From falſe opinions free;
And mark how little, pilf'ring years
Can ſteal from *you* and *me*.
Each moral pleaſure of the heart,
Each ſmiling charm of truth,
Depends not on the giddy ſtart
Of wild inconſtant youth.
The vain coquet whoſe empty pride
A fading face ſupplies,
May juſtly dread the wintry gloom,
Where all its glory dies.
Leave, *ſuch*, a ruin to deplore
To fleeting forms confin'd; —
Nor age nor wrinkles diſcompoſe
One feature of the mind.
Amidſt the *univerſal* change,
Unconſcious of decay,
It views, unmov'd, the ſcythe of time
Sweep all, beſides away.
Fixt on its own Eternal Frame,
Eternal are it's joys:
While born on tranſitory wings,
Each *mortal* pleaſure flies.
While ev'ry ſhort-liv'd Flow'r of ſenſe
Deſtructive years conſume,
Thro' friendſhip's fair enchanting walks
Unfading mirtles bloom.
Nor with the narrow bounds of time
The beauteous proſpect ends,
But lengthen'd, thro' the Vale of Death,
To Paradiſe extends.

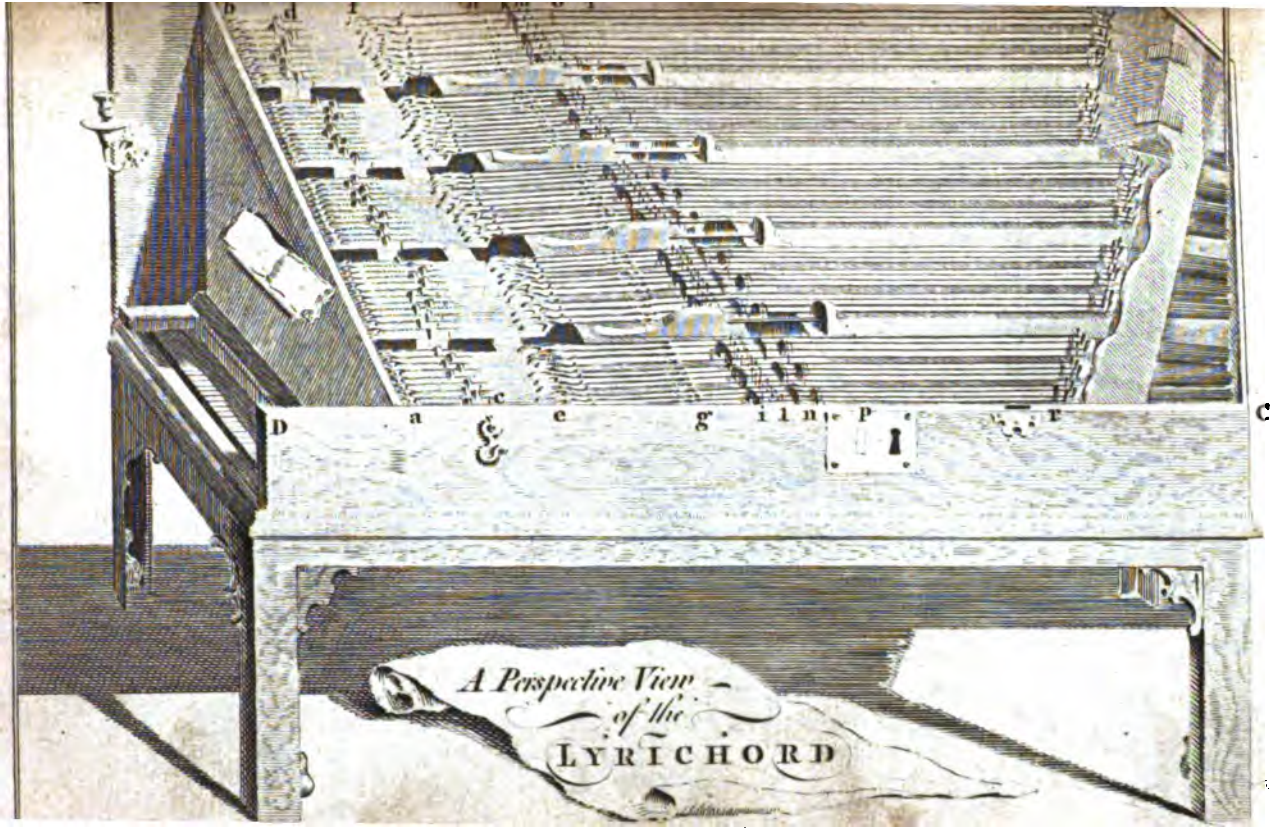
A MEDITATION.

Upon returning Home after preaching.

Written by a Clergyman now in Virginia, *who has the Care of Seven Churches, the neareſt of which is 5 miles diſtant from his abode: being part of his reflections on riding back from duty in a night which was very dark, and rainy.* Sept. 16, 1750.

TO-day my tongue, the glory of my frame,
(Far undeſerving ſuch high Dignity)
Held office, of CHRIST's *advocate with man*.
Immortal ſouls, of more important worth,
Than *Ophir*'s or *Peru*'s exhauſtleſs mines,
Are truſted to my care—— immenſeſt truſt!
What, if ſome wretched ſoul (tremendous thought!)
One, favour'd with the Goſpel's joyful ſound,
Now loſt, for ever loſt thro' my neglect,
In dire, infernal glooms (more tenfold dark
Than what ſurround me now) with flaming tongue
Be heaping execrations on my head?
Whilſt here, untouch'd, I dream my fears away!
What, if ſome ghoſt, cut off from life and hope,
With fierce deſpairing eyes uproll'd to heav'n,
That wildly glare and witneſs tortures deep
Be yelling horrid—"LORD avenge my blood
"On that unpitying wretch, who ſaw me run
"With full carrier the broad enchanting road
"To theſe devouring fires, yet warn'd me "not——
"Or faintly warn'd me—— and with languid "tone
"And cool harangues, denounc'd eternal hell
"And wrath divine."—At the dread, ſhocking thought
My ſpirit ſhudders—all my inmoſt ſoul
Trembles and ſhrinks. Sure if th' eternal cries
Of ſpirits reprobate can reach the ears
Of their dread Judge, they muſt be cries like theſe.
But—if the meaneſt of the happy choir,
That with eternal ſymphonies ſurround
Th' aetherial throne, can ſtand, and thus declare,
"Next to almighty Grace, that I am *here*,

"I



A Perspective View of the LYRICHORD

"I owe it to *his* care——His faithful hand
"(Regardleſs of the frowns he might incur
"From me, then madly eager after death)
"Snatch'd me, reluctant, from approaching
"flames;
"Ready to ſieze and burn unquenchable.
"May richeſt Grace reward his pious zeal
"With ſome bright manſion in this world of
"bliſs."
Tranſporting thought! O, then be bleſt the
hand
Who form'd my elemental clay to man!
And ſtill ſupports me!——'Tis well worth to
live,
If I may live to purpoſes ſo great!——
Awake my dormant zeal! for ever flame
With generous ardours for immortal ſouls!
Souls, with CHRIST's blood, God's dear,
beſt jewel, bought.
Rich gem! th'exhauſted treaſury of heav'n.
Be mine the bliſs that ranſom to apply!——
And may my head, my tongue, my heart, my
all,
Spend, and be ſpent, in ſervice ſo divine.

THE FADING ROSE,

Or *SYLVIA instructed*.

BLuſhing, gay, but prickly Roſe,
Emblem, true, of human woes:
Emblem too of all the joys
That our ſorrows counterpoiſe.
Pierc'd thou ſtand'ſt with thorny darts;
Such the bliſs of human hearts.
Short thy beauty, (deck'd ſo fine)
Fully blown; thy ſweets decline.
Mine's the ſplendour of an hour,
Like to thine, ſweet fading flow'r!
Man impatient will not ſtop,
Thee, but opening, he muſt crop:
Canker, inſects, ſtorms of hail
Thy frail body oft aſſail.
Foes like theſe ſhould'ſt thou eſcape,
Time is ſure to mar thy ſhape.
In full bloom I view'd thee laſt,
Now I ſee thy prime is paſt;
Thou who wert ſo freſh, ſo gay,
Ne'er wilt ſee thy yeſterday.
What to-morrow thou ſhalt be
I ſhall ne'er more prize to ſee.
From thy fate I'll ſtrive to learn
What may moſt my weal concern;
Youth and beauty will decay,
Time and death call ſoon away.
Charms enduring I will ſeek,
Which outvie the blooming cheek.
Charms, which all internal are;
Charms, which make old age e'en fair.
Virtue, like her ſiſter Truth,
Bloſſoms in immortal youth.

Briſtol, Stokes Croft,
July 2, 1755. J. N.

ELEGIAC ODE.

I.

AScend, my muſe, and ſeek a loftier ſtrain,
Not all in ſhrubs and *Tamariſks* delight;
Sing now the dangers of the fairy train
That met in manſion-houſe to paſs the night
In ſong and dance, and jocund revelry——.
But ah! no earthly joys can ever certain be!

II.

Sing how did there the gay aſſembly meet;
Aſſiſt me parent of the crooked lyre,
Like *Hermes* dreſt with wings at head and feet,
Aſſiſt me, and thy poet's breaſt inſpire;
For there were lyres and flutes and harp and
fiddle,
And ſome ſung toll-de-roll, & ſome ſqueak'd
tweedle diddle.

III.

Some dæmon ſure, that luckleſs evening, happ'd
Fly out o'er *N—b—ry*, to take the air:
He ſaw the dancing-room all mopp'd and
ſwept,
Ods me! quoth he, "What doings have we
here!"
This ſneaking town attempts to ape the
court?
But, truſt me, I'll for this time ſpoil their
ſport.

IV.

So ſaid, ſo done; at ſix, that fatal night,
The weſt wind blows; who duſk and horror
brings.
He veils his face, of darkneſs and affright,
While torrents ſpout from his ſhow'r-drip-
ping wings;
What terrors now attend the hapleſs fair!
For all the town affords but one poor paul-
try chair.

V.

But now, poſt-chaiſes all the nymphs re-
quir'd,
Some from St. *George*, and from our good
King's Arms;
But in the town all vehicles are hired——
Yet females to the ball-room run in ſwarms.
The ſchool, that morn, on all machines did
ſeize,
One chaiſe could well contain ſeven ſmall
young *Belles* with eaſe.

VI.

But think not yet their happineſs ſecure:
And lend an ear attentive while I ſing
The perils of thoſe maids, who dar'd endure
The evils rain on bruſſels-heads might bring;
(For, not the heavieſt rain, with lightning
join'd,
Can make one real woman change her mind.)

VII.

Now 'gan the dances, by our *Gallic* foes
Contriv'd; when, lo! a mighty craſh is heard,

A craggy ſtone its frightful viſage ſhows,
Huge, rugged, by a ſtrenuous arm upreard;
Slow thro' the air flies the terrific maſs,
And ſtrews the room with crumbs of ſand and ſhiver'd glaſs.

VIII.

The pond'rous rock thund'ring on the floor,
Each nymph, affrighted, ſeeks a ſafe retreat,
Some crowd the not enough capacious door,
Some fain would thro' the windows ſeek the ſtreet.
What rout might engine worſe have wrought *per die*,
When one poor ſtone thus makes a troop of females flee.

Cottenham, *Sh—g—n O'R—rk.*
May 18.

To a Gentleman, *who deſired* proper materials *for a* MONODY.

FLowrets— wreaths— thy banks along—
Silent eve— th' *accuſtom'd* ſong—
Silver ſlipper'd— whilom— lore—
Druid— Paynim— mountain *boar*—
Dulcet— eremite— *what— time*—
(" Excuſe me— here I want a rhime.")
Black-brow'd night— Hark! ſcretch-owls ſing!
Ebon cap— and raven wing,
Charnel houſes— lonely dells—
Glimm'ring tapers— diſmal cells—
Hallow'd haunts— and horrid piles—
Roſeate hues— and ghaſtly ſmiles—
Solemn fanes— and cypreſs bow'rs—
Thunder-ſtorms— and tumbling tow'rs—

Let theſe be well together blended—
Dodſley's your man— the poem's ended.

Croydon, Surry.

LOVE *in* FLAMES.

A SONG.

I.

LET Bards leſs inſpir'd their dull talents employ
In chaunting old *Dido*, or * *Helen* of *Troy*:
No heroines ſo ſtale you'll recorded find here,
For I ſing of the lovely Miſs *B—ſy La—vi-re.*
Wou'd you taſte of the ſweets that bleſt *Araby* yields?
Or breathe in *Amboyna*'s more delicate fields?
Wou'd you taſte of all theſe? with chaſt rev'rence repair,
And ſip the ſoft lips of Miſs *B—ſy La—vi-re.*

II.

Not the tint of the tulip's moſt exquiſite dye;
Not the glow of the roſe, with her bluſhes may view;
E'en the lilly itſelf far leſs fair would appear,
If compar'd with the lovely Miſs *B—ſy La—vi—re.*
Tho' you hid her, ye deities! up in the ſkies,
As an object too glorious for meer mortal eyes:
On a theft (like *Prometheus*) I'd am'rouſly dare,
And ſcale your ſteep walls for Miſs *B—ſy La—vi—re.*

III.

Or if fate ſtill more envious had nine times faſt bound her:
With *Phlegethon*, *Styx*, and *Cocytus*, all round her:
Their Banks I'd (like *Orpheus*) explore without fear,
And bring back my far lovelier Miſs *B—ſy La—vi—re.*
What tho' in my coffers but ſlender's my hoard,
And but few rich Acres poclaim me their lord?
Let Fortune grânt others their thouſands a year,
I'm content if ſhe gives me Miſs *B—ſy La—vi—re.*

IV.

Or ſhould the old gipſey, more liberal grown,
Make hundreds, and thouſands, ay millions my own,
I'd lay it down all (hear, a fond lover ſwear)
At the feet of the lovely Miſs *B—ſy La—vi—re.*
Then ceaſe your contentions, ye witlings! nor tell me
Of *Chloe*'s bright eye, or the ſoftneſs of *Elmy*;
Recall your raſh ſtrains, your falſe praiſes forbear,
And all chant my more lovely Miſs *B—ſy La—vi—re.*

Gubznſs.

CAT's-PAW.

An ancient hiſtorical BALLAD *on what befel a memorable four-footed matron at* H—g—n Hall *in the famous County of* B—ks—

To the tune of Heigh Boys up go we.

I.

PUSS, a prime princeſs of the pack,
The lov'lieſt piece of white and black
Of all her purring kind;
Her fur was gloſs'd with ſable jet
And ermine ſnows—— Diſaſter yet
May royal beauty find.

II.

'Twas on a Day, ill fated ſure!
(No day is man or cat ſecure)
She left her guardian's lap:
The rooms wide-wandering, unreſtrain'd,
She chanc'd ('twas ſo the fates ordain'd)
Where ſtood a baited trap.

III.

---

* *Here the* Criticks *perhaps may laugh, as* Helen *was not of* Troy, *but of* Greece; *but for this we refer them to* Prior's Apelles.

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III.

Of guile-laid cheeſe, to rob the gin,
Too far ſhe taps her paw within,
Up flew the treach'rous ſpring:
Mice, that peep'd ſquinting from their holes,
Cou'd not help ſhouting, for their ſouls,
Huzza Boys! ſave the king!

IV.

Hum-bugg'd and vex'd, you well may think,
Scoff'd *knapt-toe* cou'd but ſit and blink
In patience, as became her,
Her ruminating mind grew ſad;
Diſgrace ſo foul muſt have drove mad
A cat leſs wiſe, tho' tamer.

V.

Her face ſhe cunningly compos'd,
Sat ſtill—— look'd prim—— as if ſhe dos'd,
The more her ſhame to ſmother:
Yet mutt'ring ſpoke ('tis ſaid ſhe ſwore)
"*Ye dogs, and ev'ry vermin whore,*
"*I'll mark you—— child and mother!*"

VI.

Her pangs to quell, as hiſt'ry ſaith,
By luck or fate there brought (your faith
For me, on which you will pin)
The miſtreſs of the jail-bound beaſt
Came, and in nick of time releaſt
The fav'rite of Miſs *K—l—p—n.*

VII.

Ah *Puſs!* with cheeſe no more make free,
(My moral caterwauls to thee;
Thus, lo! in verſe it cries out)
"*Had theſe ſcrub peſt'rers of the houſe*
"*Hearts, but, or courage of a mouſe,*
"*Zooks! they'd have claw'd* thy *eyes out.*"

A TRAP-DAY-ODE,

Set to Muſick by Dr. *Caſtrata Tony Tabby.*

The Vocal Parts (accompanied by *Cat-calls*, and a Variety of other Wind Muſick) by the Gentlemen *Boars* and Choriſters of the Band Royal in the great *Bawl-room.*

Written in humble Imitation of the incomparable and moſt incomprehenſible (that Prince of Lyric Poets) Mr. *Koley Keber.*

By *Cataline Cat-a-nine Tails*, Eſq; at the *Cat with nine Lives*, in *Cat-eat-on Street*, Volunteer laur—t and late member of the *Kit-Cat Club.*

Compos'd in Honour of the joyful and above recited *Cat—as—trophé.*

AIR. By Signior *Diſmallo Scald-Beard.*

JOY to fair Cæſar! May a Trap ne'er more teaſe her·
Whom her Miſtreſs in Diſtreſs
Did ſet looſe, and pleaſe her.

RECIT. By Mr. *Short Whiſkers.*

Boar Cats and Shes, that here meet, or aſunder buſs,
Your Pæans join; loud charg'd as fired Blunderbuſs.

AIR *piano*. By old Mrs. *Grey-ſkin* in the Cupboard.

Mice, thro' your Chinks, view trapp'd Queen *Minx*;
—Grin, grin— (Lie cloſe within)
Gaze, ſtare, hoot, ſwear,
O! rare!— There! there!
Boo-peep.

CHORUS. Of *ſlunk Kittens*
Heigh! ho!— Wail and weep.

CHORUS. Of *ſucking Mice* in the Cloſet
Peep Boo—— Boo-peep.

DUET. By Mr. *Boar-Roger* and Miſs *Priſcilla Dapple Chops.*

Join Voices all in our great Caterwauling
To ſav'd Cæſarina, in Muſic divine—a—
Sing mewing, and purring,
Melodious and fine—a.

AIR. By Maſter *Bob-Tail Crop-Ears.*

In loyal Noiſe, harmonious Joys
Tune all to different Keys your Notes;
Cats and Kitlens, ſtrain your Throats;
Io Pæan, Cat and Kitten
Sing in Chorus well befitting.

SOLO. By Signiora *Shrill-Pipes.*

Joyful roar—— Encore——

CHORUS of *Boars.*

In gen'ral ſquall, join all
Now——now——

DOG in the *Village.*
Bough, Wow wow.

GRAND CHORUS of *He-Cats, Shes* and *Kittens.*

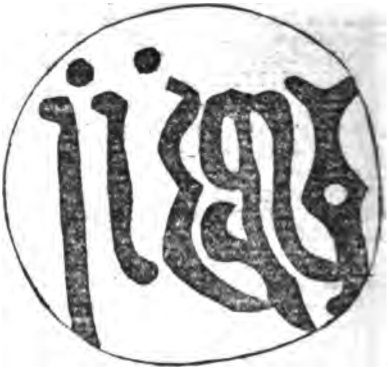
Pur—pur—Mew—mew.

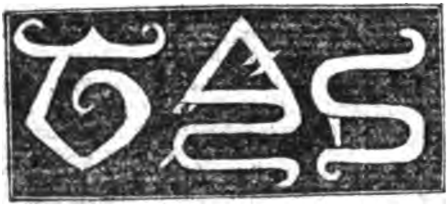
The AUTHOR *on his Birth-Day.*

'TIS lo! the day, whence firſt my life began,
And now *time* ſtamps me with the date of man:
From helpleſs infancy, to manhood rais'd;
Be *Thou* bleſt ſource of my exiſtence prais'd.
Raiſe my full mind *thy* favour to implore,
With warmth to love, with reverence to adore,
To fix the anchor of my hope on *thee*,
Thou rock, *thou* ſafeguard of my *hope* and me:
Thro' mazy life, conduct my erring youth,
And teach my *ſoul* thy everlaſting truth;
Paſſion's fierce tide in bounds to rule within,
All wilful folly, and all thoughtleſs ſin;

Of *right* of *wrong* to have thy laws impreſt:
(Reign *Thou*, in *them*, the Monarch of my
breaſt;)
To check *intemperance* in it's earlieſt riſe,
Each root of *folly*, and each ſeed of *vice.*
Of future life, be this my whole requeſt,
Content, in what thy will allots, to reſt;
(Nor proudly high, nor baſely low, to fain,)
No raptur'd pleaſure, and no poignant
pain,
But the cool *medium*, which unmiſsled knows
The glaſſy ſurface of a calm repoſe.
To act in life far better than my fears,
And *riſe* in *wiſdom*, as I *grow* in years;
To heav'ns high bliſs, with ardent zeal aſpire
Chearful to *live*, nor with *regret expire*.
And if reflection to my mind can give
The pride, to wiſh my memory may live,
'Tis this— He was— (in future be it ſaid)
When living uſeful, nor leſs lov'd when dead.

Theſe Characters are in a Pane of Glaſs in the Vicarage-Houſe at Cranbrooke.

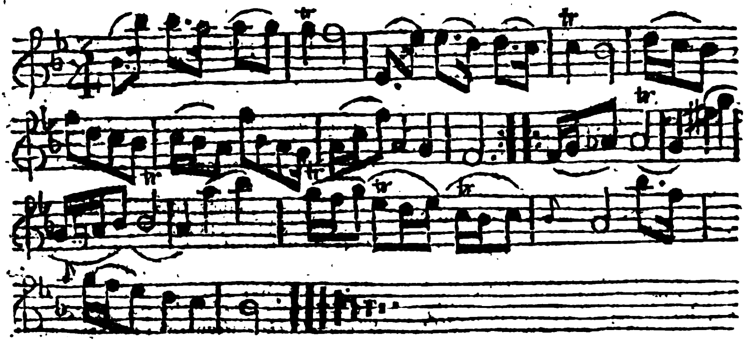




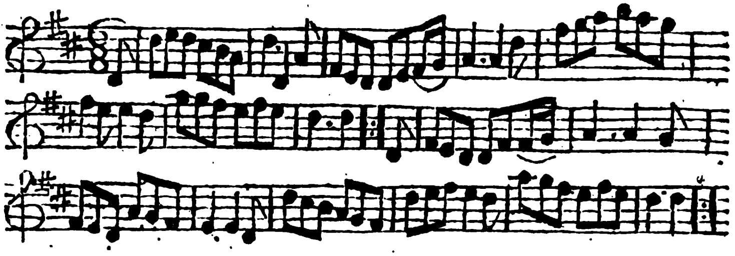
Theſe Characters are taken from a Braſs Plate on a Tomb-ſtone in *Cranbrooke* Church, and are propoſed here for the Antiquarian to decypher.

The Piece to a Lady on her Paſſion for Dr. Watts's *Logic, the* Widow's *Verſes to* Damon, *the* lighted Pipe, *the* Parſon *to his* Perukemaker, *with ſeveral others received, ſhall be inſerted the very firſt Opportunity.*

A MINUET.



The Sweet Concluſion. A Country Dance.



Firſt Co: lead thro' the 2d Co. and caſt up ∸ croſs over and turn ∸ foot it, and Hands round with the 3d Co. ÷ Right and Left at Top ÷

A Chronological Memoir *of* Occurrences,

For *AUGUST* 1755.

Copenhagen.

ON the 13th of July, we had a moſt terrible Storm, accompanied with Hail and Thunder, which was general almoſt throughout the Kingdom. In Holſtein and Sleſwick 13 Houſes were conſumed by the Lightning, and in ſeveral Places the Corn is entirely ruined by the Hail.

From Landſhut in Sileſia we have ſuch Accounts of a Storm that lately happened there, as are uncommon, eſpecially in that Country; the moſt peculiar Circumſtance is, the gathering of a Whirlwind, which took up a great Quantity of Water, and bore it up a ſmall Height like a thick black Cloud, and then at laſt it fell all at once, with incredible violence. The Damage it occaſioned is very conſiderable, and the Appearance during the Storm, impoſſible to be deſcribed.

Cracow. On the 23d of July, about 3 in the Afternoon, a dreadful Fire broke out in the Monaſtery of the Viſitation, which in a ſhort Time burnt down 70 Houſes and 5 Churches. If the Monaſtery had not been broke open, both the Nuns and Boarders muſt have periſhed in the Flames.

LONDON.

THE following Letter on the Succeſs of the Britiſh Arms in America, has been publiſhed by Authority.

Extract of a Letter from Lieut. Gov. Lawrence *to Sir* Thomas Robinſon. *Dated* Hallifax, June 28, 1755.

" I have the Honour to acquaint you, that the French Fort at Beauſejour ſurrendered to Lieut. Col. Monckton the 16th Inſt. and the next Day a ſmall Fort upon the River Gaſpereau, running into the Bay Verte, where the French had their principal Magazine for ſupplying the French Inhabitants and Indians. In theſe Forts were found a great Quantity of Proviſions, and Stores of all Kinds, of which Col. Monckton has not yet had Time to tranſmit me a particular Account. I incloſe you the Terms of Capitulation. Notwithſtanding the Fort at Beauſejour had 26 Pieces of Cannon mounted, they ſurrendered, after four Days Bombardment, before we had even mounted a ſingle Cannon upon our Batteries. Our Loſs, upon this Occaſion, is very inconſiderable, not above 20 killed, and as many wounded. Major Preble of the Irregulars is ſlightly wounded in the Shoulder; Enſign Tongue, of Major Gen. Warburton's Regiment, acting as Sub Engineer, received a Shot in his Thigh, as he was taking a Survey of the Ground for the Trenches and Batteries to be raiſed againſt the Fort; and Enſign Hay, of Col. Hopſon's, who had been taken Priſoner by the Indians, in going alone from our Fort to the Camp, was killed by one of our Shells in the French Fort, which fell through a Sort of Caſement, and alſo killed three French Officers, and wounded two more.—At Col. Monckton's firſt arrival, the French had a large Number of Inhabitants and Indians, 450 of which were poſted at a Blockhouſe, which they had on their Side of the River Maſſaguaſh, to defend the Paſs of that River: Here they had thrown up a ſtrong Breaſt-work of Timber for covering their Men, and had Cannon mounted on the Blockhouſe. At this Place they made a ſtand for about an Hour, but were forced by our Troops with ſome Loſs, leaving their Blockhouſe, and the Paſs of the River, clear for our People, who marched, without further Interruption, to the Ground intended for their Encampment. As we had not Men enough to inveſt the Fort entirely, ſeveral got away; and, when the Fort ſurrendered, there remained 150 Regulars, and about 300 Inhabitants, ſeveral of which, with their Officers, were wounded. We do not yet exactly know the Numbers that were killed in the Fort, but we believe their Loſs has not been trifling, as ſeveral lay half buried upon the Parade. Col. Monckton has new named the Fort, and called it Fort Cumberland. He gives the Troops, under his Command, great praiſe for their good Behaviour, and the Spirit and Reſolution with which they acted upon this Occaſion.—Col. Monckton is proceeding to the Fort at St. John's River, which I flatter myſelf will give him very little trouble, as their main Strength, which was Beauſejour, is gone: He has likewiſe my Orders to leave a Garriſon in that Fort, as it is infinitely better than ours, as well for Situation, as Strength. The deſerted French Inhabitants are delivering up their Arms. I have given him Orders to drive them out of the Country, at all Events; though, if he wants their Aſſiſtance in putting the Troops under cover (as the Barracks in the French Fort were demoliſhed) he may firſt make them do all the Service in their Power. Our Poſſeſſion of the Iſthmus, it is to be hoped, will bring over the Mickmack Indians to our Intereſt.—I cannot cloſe my Letter to you, Sir, without taking Notice how much I am obliged to Lieut. Col. Monckton's military Skill, and good Conduct, for our Succeſs at Beauſejour; Capt. Rous, who commanded the naval Part of this Expedition, has been of the greateſt Service to it, and I have Reaſon to believe our ſucceeding ſo ſoon, and with ſo little Loſs, is much owing to the good Management of Mr. Brewſe, who acted there as chief Engineer."

Terms of Capitulation granted to the Commander and Garriſon of Beauſejour.

The Commander, Officers, Staff-Officers, and others, employed for the King and the Garriſon of Beauſejour, ſhall march out with their Arms and Baggage, Drums beating.—The Garriſon ſhall be ſent directly by Sea to Louiſbourg, at the Expence of the King of Great Britain.—The Garriſon ſhall be provided with ſufficient Proviſions for their Paſſage to Louiſbourg.—With regard to the Acadians, as they have been forced to take up Arms on Pain of Death, they ſhall be pardoned for the Part they have been taking.—Laſtly, The Garriſon ſhall not bear Arms in America for the Space of ſix Months.

The Terms abovementioned are granted upon Condition that the Garriſon ſhall be delivered up to the Troops of the King of Great Britain, at ſeven o'Clock this Afternoon. June 16, 1755.

The Fort at Beauſejour (in Engliſh the Fair Reſidence) taken from the French, as alſo that of Bay Verte, were both built by them ſince the Peace of Aix la Chapelle. Theſe Forts ſtand about twelve Miles aſunder, on both Sides of the Iſtmus of Nova Scotio; Beauſejour, in the Bottom of the Bay of Fundy, and Bay Verte, in the South-weſt Side of the Peninſula. From theſe Forts the French have furniſhed the Cape Sable or Mickmac, and the Iſland of St. John Indians, who make 300 fighting Men, with Arms, Proviſion, and Cloathing. With theſe Indians the French have conſtantly harraſſed our Infant Colony of Nova Scotia, and reduced it frequently to great Diſtreſs, by carrying off the Engliſh, and ſcalping Numbers, and by deſtroying their Plantations. One Night theſe Indians, with diſguiſed French, ſurprized the Village of Dartmouth, burnt the Houſes, and put all the Inhabitants to Death. When the French had built the above Forts, they threatened to deſtroy all the French Subjects of England, if they did not retreat behind theſe Forts, which obliged them to deſtroy their Settlements, and put themſelves under their Protection. Theſe are the People called Acadians in the Treaty of Capitulation; and they became the Subjects of Great Britain, when Nova Scotia was reduced in 1710. There are about ten or fifteen Thouſand of theſe French Neutrals, as they are called in the Province. But by the Succeſs of his Majeſty's Arms in reducing theſe Places, theſe People who were lately turned dangerous Enemies, will be reduced to become Subjects of the Crown of England. The Infant Colony of Nova Scotia, by keeping Poſſeſſion of theſe Forts, will be preſerved from the Depredation of theſe Indians; and when the Fort at St. John's River is ſubdued, all the Province of Nova Scotia will be reduced, and brought under our Subjection.

We hear that there are now a-float on the Lake *Ontario* two *Britiſh* Ships of War mounted with Braſs Cannon, which were built at *Deptford*, and carried over in Frames, ſo as to be put together immediately when Occaſion offered. If this be true, it will effectually cut off all Communication between *Canada* and *Luiſiana*, and conſequently curb at once all the ambitious Deſigns of our Enemies on that Side.

July 24. The Admirals Hawke and Weſt ſailed from Spithead with 18 Ships of the Line, on a ſecret Expedition.

Aug. 1. As ſome Labourers were digging a Foundation for a Meeting-houſe in Red-croſs-ſtreet, they found ſome ancient Pieces of Gold to the Value of 70 l.

A Baronet's Son, ſaid to have killed a Man at Brentford, was tried at Chelmsford, when after a long Trial, ſeveral Circumſtances appearing in his Favour, the Jury brought in their Verdict, ſpecial.

6. This Day a Survey was made of all the Ships in the River fit to be employ'd in the Service of the Government as Frigates of War, and a Report has been made of them to the Commiſſioners of the Navy.

8. The Commiſſioners of the Navy contracted with ſeveral Merchants for 24 Ships, of about 400 Tons each, and 12 large Colliers, for the immediate Service of the Government.

There was this Day a ſmart Preſs for Seamen, in the Out-parts of the City.

By Order of the Lords of the Admiralty, twelve Frigates and Sloops have been lately built in private Yards.

12. The Parliament was prorogued to Tueſday September 2.

The Rt. Worſhipful Sir Robt. Ladbroke, by Virtue of a *Locum Tenens* from the Right Hon. the Lord Mayor, went in the State-coach to the Queſt-room in Trinity-court, Alderſgate-Street, and held a Ward-mote; when Geo. Nelſon, Eſq; Deputy of Queenhith Ward, was unanimouſly elected Alderman, in the Room of the late William Benn, Eſq;

The Rt. Hon. the Lord Anſon and ſeveral of the Admiralty have been to Woolwich, to ſee a Proof of ſome new-invented Guns that are but half the ordinary Weight, and yet will do as much Execution.

15. A Letter was ſent to the Maſter of Lloyd's Coffee-houſe, from the Admiralty Office, deſiring that the Merchants might be inform'd, that ſeveral of his Majeſty's Ships would ſoon be ſent from Spithead to the Mediterranean and the Weſt Indies; and thoſe Merchants who were deſirous of having their Ships proceed in Company with the Men of War, were deſired to give Orders for their Ships to rendezvous at Spithead as ſoon as poſſible.

Upwards of 40 Deſerters arrived in Town from *France*, who ſay that many more are upon the Road.

Joſeph Wright and Thomas Grimes were executed at Coventry for the deteſtable Sin of Sodomy; Wright confeſſed that he had been guilty of the Crime for which he ſuffered, but never with Grimes; and Grimes abſolutely denied his ever being Guilty of it at all, either with Wright, or any other Perſon.

18. Col. Yorke, the Engliſh Miniſter at the Hague, has given Orders that no Packet-Boat from Harwich to Helvoetſluys, or from Helvoetſluys to Harwich ſhall for the Future carry any Money, leſt the French Privateers might be tempted to attack them.

19. This Morning arrived here from Hanover, one of his Majeſty's Meſſengers, with Orders for the Departure of the Yachts to Helvoetſluys.

20. An Expreſs was ſent to Ld. Delawar, at his Seat at Bolderwood, in Hants, deſiring his Attendance to go on Board the Yacht to accompany his Majeſty from Hanover.

By Letters from Charles Town South Carolina, we are informed, that they have ſhipped in the laſt Year, ending in April, 200,000lb. of Indico to England. So much has the Production of that Commodity been encreaſed in that Province, by allowing a ſmall Bounty here on its Importation.

The Rt. Hon. the Lords of the Admiralty have ſent a ſecond Letter to the Maſter of Lloyd's Coffee-houſe, deſiring him to acquaint the Merchants, that any of their Ships bound to Liſbon, Oporto, St. Lucar, or Cadiz, may have Convoy, by repairing to Spithead.

21. Orders were ſent to the Exciſe Office to ſend Expreſſes to all the Offices Northward, to ſtop and ſend under a Guard to London a Perſon who landed at Harwich, and lay at Malden on Sunday Night laſt; and alſo to ſeize his Baggage, and all in Company with him.

There are Letters from Boſton in New England, dated the 18th of *July*, by which it appears that the French have abandoned St. John's Fort in Fundy, after nailing up the Cannon, for Want of Leiſure or Conveniency to carry them off.

22. Came on again the Election of a Sheriff for this City and County of Middleſex, when Mr. Alderman Beckford was by a great Majority of Hands declared duly elected.

A moſt valuable Work of Antiquity has been lately diſcovered at Bath. Under the

Foundation of the Abbey-houſe now taking down, in order to be rebuilt by the Duke of Kingſton, the Workmen diſcovered the Foundations of more antient Buildings, and fell upon ſome Cavities, which gradually led to further Diſcoveries. There are now fairly laid open the Foundations and Remains of very auguſt Roman Baths, and Sudatories, conſtructed upon elegant Plans, with Floors ſuſpended upon Square-Brick Pillars, and ſurrounded with tubulated Bricks, for the equal Conveyance of Heat and Vapour. Their Dimenſions are very large, but not yet fully laid open, and ſome curious Parts of their Structure are not yet explained. It were to be wiſh'd that Gentlemen curious in Antiquities, and well vers'd in the Nature and Structure of Roman Baths, would take a View of the Spot, in order to complete the Explication of the whole Deſign, towards which many Data already appear, which may not only afford an entertaining Speculation, but lead us to very uſeful Improvements of our own Baths, ſince it certainly appears, that the Roman Soldiers, tho' in ſo remote a Station, entertained higher Ideas of Convenience, Elegance and Uſes of Baths, than the ſettled and opulent Inhabitants of Britain have yet propoſed to themſelves.

We ſhould be greatly obliged to any Gentleman on the Spot who would favour us with a more particular Account of this Diſcovery.

Whitehall, Auguſt 26, 1755. By his Majeſty's Ship the Sea-horſe, from Virginia, Advice has been received, that Major Generel Braddock, having advanced with 2000 Men, and all the Stores and Proviſions, to the Little Meadows (about 20 Miles beyond Fort Cumberland at Will's Creek) found it neceſſary to leave the greateſt Part of his Waggons, &c. at that Place, under the Command of Col. Dunbar, with a Detachment of 800 Men, ordering him to follow as faſt as the Nature of the Service would admit. The General having, by this Means, leſſened his Line of March, proceeded with great Expedition, his Corps then conſiſting of about 1200 Men, and 10 Pieces of Artillery, together with the neceſſary Ammunition, Stores, and Proviſions. The 8th of July, he encamped within 10 Miles of Fort Duqueſne; and, on the 9th, on his March through the Woods towards that Fort, was attacked by a Body of French and Indians, who made a ſudden Fire from the Woods, which put the Troops into great Confuſion, and occaſioned their retiring with great Precipitation, notwithſtanding all the Endeavours of the General, and the Officers, many of whom were killed, while they were uſing all poſſible Means to rally the Men. The General, who exerted himſelf as much as Man could do, after having five Horſes killed under him, was ſhot through the Arm, and the Lungs, of which he died the fourth Day. It is reckoned, that there were about 200 killed, and 400 wounded; the latter are moſtly collected at Will's Creek, to which Place Colonel Dunbar, with the Remainder of the Troops, was retired; from whom a more particular Account is expected.

A Liſt of the Officers killed and wounded.

STAFF. Maj. Gen. Braddock, died of his Wounds; Robert Orme and Roger Morris, Eſqrs. Aids de Camp, wounded; William Shirley, Eſq; Secretary, killed; Sir John St. Clair, Deputy Quarter-Maſter Gen. and Matthew Leſsley; Gent. Aſſiſtant to the Quarter-Maſter General, wounded.

Late Sir Peter Halket's Regiment.

Sir Peter Halket, Col. killed; Lieut. Col. Gage, wounded; Capt. Tatton and Capt. Gethins killed.

Subalterns. Liettenants, Littleler, Dunbar, Treeby, Simpſon, and Lock, wounded; Lieutenants, Halket and Allen killed; Diſney, Kenedy, Townſend, Nartlow, and Pennington wounded.

Colonel Dunbar's Regiment. Lieut. Col. Burton, Maj. Sparks, Captains Bowyer and Roſs, wounded; Capt. Cholmley killed.

Subalterns. Barbut, Walſham, Glandwin, Edmeſton, Montreſeur, Macmullen, Crow; and Sterling, wounded; Crimble, Wideman, Hanſard, Brereton, and Hart, killed.

Artillery. Capt. Lieut. Smith, killed; Lieutenants, Buckhanon, M'Cloud, and M'Culler, wounded.

Engineers. Peter M'Keller, Robert Gordon, and —— Williamſon, Eſqrs. wounded.

Detachment of Sailors. Lieut. Spendelow, and Mr. Talbot, Midſhipman, killed.

Capt. Stone, of Gen. Laſcelles's Regiment, killed.

Capt. Floyer, of Gen. Warburton's Regiment, wounded.

Independant Companies of New York.

Capt. Gates, wounded; Lieut. Sumaie, killed; Lieutenants, Howarth and Gray, of Capt. Demercie's Independent Company, wounded

Virginia Troops. Captains, Poulſton and Peronie, killed; and Captain Stephens, wounded.

Subalterns. Hamilton, Wright, Splitdorff, and Wagoner, killed; and Stuart wounded.

BIRTHS.

Aug. 1. The Counteſs de Valde Sotto delivered of a Daughter.

2. The Hon. Lady Katherine Stanhope, Lady of Edwin Francis Stanhope — of a Daughter.

MAR-